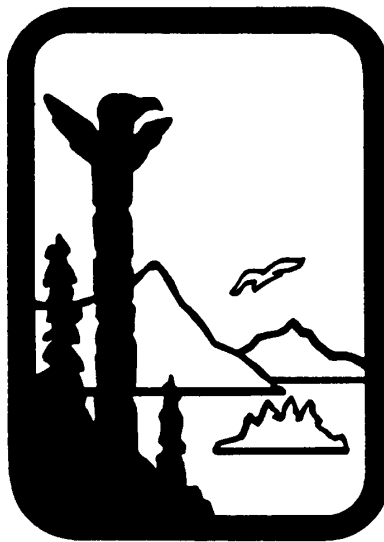# DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ALASKA I/M PROGRAM MANUAL

**Including Inspection and Repair Procedures
for Certified Mechanics and Certified Stations**

February 21, 2002

This manual is to be used with 18 AAC 52, **Emissions Inspection and Maintenance Requirements for Motor Vehicles**. This manual includes simplified informative summaries of portions of 18 AAC 52. If clarification is needed, please review the applicable provisions of 18 AAC 52, which are legally controlling.

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Part I

Alaska2000 Emissions Inspection System (EIS)
Specifications

SECTION 1 - GENERAL SPECIFICATIONS

PURPOSE: This section describes the general specifications of Alaska2000 EIS (Emissions Inspection System). The EIS must be used to perform vehicle emissions inspections in Alaska.

1.1 BACKGROUND INFORMATION

The State of Alaska has two serious carbon monoxide (CO) nonattainment areas, Anchorage and Fairbanks. Unlike many other areas in the United States, the Alaska CO nonattainment areas do not have ozone-related air quality problems; thus, there is little need to control emissions of hydrocarbons (HC) or oxides of nitrogen (NOx). Basic I/M programs were implemented in both nonattainment areas beginning in 1985, using a decentralized (test-and-repair) network, an annual 2-speed idle test, a range of visual and functional checks, and BAR84 emissions analyzers. The programs were largely patterned after the California Smog Check program, with the program design and test procedures modified somewhat due to the CO-only nature of the air pollution problem in the two communities and the cold temperature conditions experienced during the winter months.

The two programs were upgraded in 1994 with the use of BAR90 test analyzer systems (TAS) and biennial vehicle inspections. Two manufacturers had BAR90 equipment certified for use in Alaska: SPX and Snap-On Diagnostics. Both programs are administered by local air pollution control agencies, with the State of Alaska responsible for providing technical oversight.

In developing the Alaska2000 EIS specifications, the Alaska Department of Environmental Conservation used the Pennsylvania Phase II specification document as the main template. Elements of an early version of New Jersey's draft PIF equipment specifications document (i.e., sections 1, 2, 4 and appendix A) were also incorporated. The department has attempted to maintain consistency with the Pennsylvania specifications as much as possible to help reduce the cost (e.g., in software development) of designing and manufacturing EIS units for Alaska. However, there are a number of elements of the specifications that had to be deleted, modified or expanded to meet our specific needs. For example, given the CO-only air quality problems in Anchorage and Fairbanks, there is no need to implement either loaded mode testing or functional evaporative emissions (e.g., gas cap) tests.

The Alaska2000 program started on January 1, 2000 and uses BAR97 compliant analyzers from Worldwide Environmental Products, Inc. The program uses an electronic transfer system to download vehicle identification data from the files of the Alaska Division of Motor Vehicles (DMV) to the EIS and to upload test information from the EIS to a central test database, which is managed by Alaska Department of Environmental Conservation (ADEC) personnel. On July 1, 2001, the Alaska2000 program began pass/fail On-Board Diagnostics Phase II (OBDII) testing of model year 1996 and newer vehicles, bringing Alaska into compliance with a federal mandate for OBD testing of these vehicles.

1.2   LIST OF ABBREVIATIONS

(01)	AC	Alternating Current
(02)	ADEC	Alaska Department of Environmental Conservation
(03)	AIS	Air Injection System
(04)	ASCII	American Standard Code for Information Interchange
(05)	BIOS	Basic Input Output System
(06)	CAT	Catalytic Converter
(07)	cm	Centimeters
(08)	CNG	Compressed Natural Gas
(09)	CO	Carbon Monoxide
(10)	CO_2	Carbon Dioxide
(11)	Cyl	Cylinder
(12)	DC	Direct Current
(13)	DCF	Dilution Correction Factor
(14)	DOS	Disk Operating System
(15)	DMV	Division of Motor Vehicles
(16)	DTC	Diagnostic Trouble Code
(17)	ECS	Emission Control Systems
(18)	EFE	Early Fuel Evaporative System
(19)	EIS	Emissions Inspection System
(20)	EPA	U.S. Environmental Protection Agency
(21)	ESC	Emission Standards Category
(22)	ET	Electronic Transmission
(23)	ETL	Environmental Testing Laboratories
(24)	FCC	Federal Communications Commission
(25)	GB	Gigabyte (2^{30})
(26)	GVWR	Gross Vehicle Weight Rating
(27)	HC	Hydrocarbon
(28)	I/M	Inspection/Maintenance
(29)	LPG	Liquefied Petroleum Gases
(30)	MB	Megabyte (2^{20})
(31)	MIL	Malfunction Indicator Lamp (or Light)
(32)	NO_x	Oxides of Nitrogen
(33)	OBD	On-board Diagnostics
(34)	OBDII	On-board Diagnostics Phase II
(35)	OEM	Original Equipment Manufacturer
(36)	O_2	Oxygen
(37)	PCM	Powertrain Control Module
(38)	PCV	Positive Crankcase Ventilation
(39)	PEF	Propane Equivalency Factor
(40)	ppm	Parts Per Million
(41)	QA	Quality Assurance
(42)	ROM	Read Only Memory
(43)	RPM	Revolutions Per Minute
(44)	RRN	Registration Renewal Number
(45)	SAE	Society of Automotive Engineers

(46)	TIN	Transaction Identification Number
(47)	UL	Underwriters Laboratory
(48)	VEC	Vehicle Emissions Control Label
(49)	VIN	Vehicle Identification Number
(50)	VIR	Vehicle Inspection Report
(51)	VID	Vehicle Information Database
(52)	VRT	Vehicle Reference Table

1.3 GENERAL SPECIFICATIONS

a. **Microcomputer Compatibility**
   A standard microcomputer must be included in the EIS and must control all analyzer functions. The microcomputer must include all features defined in Section 6.

b. **User Interface**
    The EIS must have a simple, menu-driven, user-friendly interface. The implementation of this interface shall be consistent throughout the EIS software.

c. **Year 2000 Compliance**
   All EIS software and hardware must be fully year 2000 compliant.

d. **Communications**
   The EIS must communicate with the VID using a standard phone line and modem, as described in Section 2.

e. **Operating System**
   The analyzer operating system software must be the latest version of MS-DOS, Microsoft Windows, or IBM OS/2.

f. **Data Storage**
   Data must be recorded on standard floppy disks and a hard drive, as described in Section 6.

g. **Test Analyzers**
   A vendor must provide and transfer ownership of two approved, fully functional analyzer units to ADEC for certification and testing purposes. The test analyzers must be fully equipped with a complete set of calibration gases, printer paper, and other consumables. Subsequent calibration gases, printer paper, other consumables and any replacement

parts, other than those covered by warranty, will not be the responsibility of the manufacturer.

h. Design/Construction
The EIS must be designed and constructed to provide reliable and accurate service in an automotive repair and service center environment.

i. Useful Life
The analyzer system must have a minimum useful life of 5 years from the time of purchase.

j. Applicable Codes
The manufacturer must certify that the EIS submitted for approval complies with all applicable local, state and federal administrative, safety, ergonomic, licensing and certification requirements. The manufacturer will be held responsible for costs for analyzer modifications required to bring analyzers into compliance with legal requirements in existence at the time of certification of the analyzer. Therefore, at a minimum, *the manufacturer should contact*, in addition to UL or ETL, the Federal Communications Commission (FCC) regarding radio frequency interference and the Occupational Health and Safety Administration (OSHA) regarding the proposed EIS.

k. Data Storage

1. Tables

A. EIS: This table must contain test records that have not been transferred to the VID. A duplicate copy of this table, having the same name, must be stored on the root directory of the A: floppy disk. Both tables must be updated at the same time by the test software. This table must be purged and appended to the EISHST table upon its successful transfer to the VID.

B. EISHST: This table must contain archived test records that have been transmitted to the VID.

C. CAL: This table must contain gas calibration records from the start of any calibration test, which have not been transferred to the VID. This table must be duplicated and archived in the same manner as the EIS table.

D. CALHST: This table must contain gas calibration records from the start of any calibration test, which have been transferred to the VID.

    E. ESC: This table must contain the emission standards for the idle test and 2500 RPM test.

    F. LOCKOUT: This table must contain the lockout data for multiple conditions and must be transmitted to the VID and downloaded from the VID and read prior to each official I/M test. Specific lockout conditions are listed in Section 4.

    G. TECH: This table must contain the information on each I/M certified mechanic currently able to perform emissions inspections at this station and with this analyzer. Updates to this table will be transmitted from the VID during the first call of an inspection, if necessary.

    H. LOADSTICKER: This table must contain sticker ranges loaded into the EIS. The sticker ranges may have been loaded at the VID or manually from the analyzer.

    I. DTC: This table must contain a list of diagnostic trouble codes for use in the OBD portion of an I/M test.

    J. REGION: This table must contain data unique to the region where the analyzer is located. This data is obtained from the VID.

    K. STATION: This table must contain station data. This data is obtained from the VID.

    L. VRT: This table must contain Vehicle Reference Table data. This data is obtained from the VID.

2. Duplication of Data on the State Floppy Drive

    A. In order to limit analyzer downtime after serious hard disk malfunctions, the manufacturer must store duplicate files on the State floppy disk drive. The tables to be duplicated, at a minimum, are the EIS, CAL, and LOADSTICKER. These tables must be mirrored on the floppy and hard disk at all times.

    B. The analyzer must copy the tables specified above from the hard disk to the floppy after a State representative performs a disk change.

    C. In the event a loaner analyzer unit is placed in a testing station or complete replacement of the hard drive is required, the manufacturer must have a method and procedure to copy the station data, analyzer ID, and other data stored on the floppy disk to the new hard drive.

l. Technical and System Documentation

1. The analyzer system software must be fully documented. The manufacturer must supply ADEC with two (2) copies of the documentation listed below. The manufacturer must agree, in writing (signed by the chief executive officer of the company), to submit copies of the program listings to ADEC, upon request, within a timeframe satisfactory to ADEC, or whenever a decision is made by the manufacturer to voluntarily suspend or terminate production of the analyzer system. ADEC does not require the manufacturer to supply the code with the application for certification. ADEC may require that copies be provided, should the need arise. Software documentation must include at least the following:

A. complete program listings, including the source code, must be provided by the manufacturer upon request (these do not have to be submitted with the application for approval);

B. functional specifications;

C. functional flowcharts of the manufacturer's software;

D. detailed interface information on the optical bench including the identification of protocol and output specifications; and

E. all table layouts with table names, table types, table security, field names, field types, field sizes, and field editing criteria.

2. Any records, reports, and information, and parts of records, reports, and information, other than emission data, provided to ADEC or an authorized local program by the manufacturer are considered confidential records, and will be kept confidential and in separate files if, pursuant to AS 46.14.520, the manufacturer has certified under oath to ADEC or an authorized local program pursuant to AS 46.14.520 that public disclosure would tend to affect adversely the manufacturer's competitive position; and the records, reports, or information, or parts of the records, reports, or information, would divulge production figures, sales figures, processes, production techniques, or financial data of the manufacturer that are entitled to protection as trade secrets under AS 45.50.910-AS 45.50.945. The manufacturer shall mark each record, report, and information, and parts of records, reports, and information, at the top and bottom of each page with the word "Confidential" in bold.

m. Availability of Circuitry
All integrated circuits used in the analyzer system must be types and brands that are presently in common usage. Custom ROM programs developed by the manufacturer are acceptable.

n. Telephone Requirements
Each inspection station must be equipped with a dedicated voice-grade telephone line utilizing a standard RJ-11 connector, to which the EIS must be connected at all times. The manufacturer is not responsible for providing this phone line but must verify its existence and operation during the EIS installation.

o. Printer
Each EIS shall include a laser printer as defined in Section 6 of this Part I.

p. Bar Code Readers
Each EIS must have a non-contact bar code scanner, and necessary interface software and hardware, as described in Appendix A.

q. Clock/Calendar

1. The analyzer system unit must have a real time clock/calendar which must provide the current date and time.

2. Analyzers must store the date and time on the test record. For the display, the date must be indicated as follows: MM/DD/YYYY. The time must be a twenty-four (24)-hour clock format.

3. The date/time, along with the time the inspection or test started and when it ended, must be included in the test record. The start time is immediately after the mechanic enters a correct access code. The end time is just prior to the VIR print option.

4. The analyzer clock/calendar must be equipped with a battery backup feature and a battery with a five-year expected life.

5. The analyzer system must update its clock/calendar so it will match the clock/calendar of the VID. This update must be automatically performed on the initial contact to the VID for every test that the analyzer performs.

r. Test Record Storage
The EIS floppy disk drive must store current test records. Current records that have not yet been transmitted to the VID are stored in the EIS table.

s. Data and File Transfer

1. Mode: The EIS table must be capable of being stored and transferred from the analyzer system by use of the floppy disk.

2. Modem

    A. A telephone cable, separate from the power cord, must be provided for the modem by the manufacturer.

    B. If the modem fails to receive an answer, receives a busy signal, or if inspection data is not transferred to the VID in the specified time, an appropriate message, as noted in the data communications specification, must be displayed by the EIS. The analyzer system must allow the station to continue performing inspections and must print an advisory notice on the VIR as detailed in Appendix D. The analyzer must lockout the EIS after performing a set number of inspections in a set number of calendar days without a VID contact. The values of these elements must be stored in the REGION table.

3. Diskettes: Diskettes must be removable. Both a 3.5" floppy disk drive and the drive port must be secured logically and physically to permit only authorized ADEC and manufacturer access. Vendor methodology to restrict such access must be approved by ADEC.

t. **Software Versions/Updates/Modifications**

1. The software version must be indicated on the analyzer status screen, on each vehicle test record and on the Vehicle Inspection Report (VIR). The version number must consist of a three (3) digit code to be made up of a digit for the major revision number followed by a "." followed by 2 digits for sub versions of the software (i.e., 1.10). The version of software used in running every vehicle test must be indicated on the test record.

2. The equipment manufacturer must provide a total of one ADEC-initiated and approved software update during the useful life of the EIS at no additional cost to the purchaser for either programming or installation. This update need consist of no more than 750 hours of total software development time. Prior to use of the software update in official I/M inspections, it must be installed on ADEC's analyzer for approval testing; and the manufacturer must obtain written ADEC approval of this update, and include the correct software version number so that it is recorded to the test record and printed on each VIR. The manufacturer must notify ADEC in writing when the update is complete.

3. The analyzer manufacturer must notify ADEC in writing if they wish to initiate and perform a software update. A manufacturer-initiated update will not be counted toward the one (1) ADEC initiated-update as identified in section 1.3.t.2 above. Prior to use of the software update in official I/M inspections, it must be installed on ADEC's analyzer for approval testing. The manufacturer must obtain written ADEC approval of the update, and install the correct software version number so that it is recorded to the test record and printed on each VIR. The manufacturer is responsible for and agrees in advance to reimburse ADEC for the cost of testing and installing

any manufacturer-initiated update. The manufacturer must notify ADEC in writing when the update is complete and provide ADEC with a list of all the analyzers that were updated. There must be no installation cost to the purchaser of an EIS for a manufacturer's initiated update.

4. All software updates must cause the software version number to change as indicated on the Analyzer Status screen (see Section 3). In addition, the updated software version number must be recorded on the test record and VIR as soon as it is installed.

5. All software updates prepared by the analyzer manufacturer, will be made available first to ADEC representatives or other authorized representatives by use of electronic data transfer. When ADEC approves full field use of the software update it will be made available for general usage, by electronic data transfer, through the Station Menu.

u. Tamper Resistance

1. EIS computer files and programs must be protected from unauthorized access and/or modification. File and program protection may consist of mechanical systems in combination with electronic/software systems.

2. The EIS must prevent I/M mechanic access to the State floppy disk drive. This drive must only be accessible to authorized State representatives.

3. I/M mechanics must not be allowed direct access to the computer operating system. Security measures must be implemented to ensure that the boot-up process cannot be interrupted. The EIS must not be able to boot from a floppy disk inserted by an I/M mechanic.

4. The physical EIS and the sampling system must be tamper-resistant. At a minimum, the manufacturer must develop tamper-resistant features to prevent unauthorized access through the cabinet. Methods must include micro switches, keyed locks and software checks.

5. If tampering occurs, a software lockout must be activated which aborts any inspection sequence in progress and prevents further emissions inspection until an authorized representative clears the lockout.

6. The lockout system must be designed so that it can be activated by a State representative from the State Menu. Only authorized State representatives may remove lockouts put in place from the State Menu.

7. The manufacturer may offer analyzers with additional floppy disk drives and hard drives that can run optional software application programs. These optional software programs must not interfere with the operation of the standard emission testing software.

8. ADEC intends for the analyzer system to be used with OBDII for a general vehicle diagnostics link. The tamper resistance features must be designed so that these and other available software programs, especially those dealing with repair and diagnostics of vehicles, can be added without interference to I/M functions.

9. Optional software packages supplied by the manufacturer must not interfere with the normal operation of the State inspection and testing software, and must not compromise the tamper-resistance of the analyzer (such as the inability to access the operating system). ADEC must be notified in writing prior to installation of any optional software, and must be provided with documentation regarding the function of the optional software.

10. A keylock and microswitch must be used to secure the state floppy drive door on all analyzer systems.

v. **Authorized ADEC Representative Access to Test Records**

1. The EIS software must be designed to include secure provisions for retrieving and copying the test record table (EIS) to a floppy disk for QA and enforcement purposes.

2. There must be a menu item on the State Menu that allows a record search to be performed. The search must locate, display and printout test records based on date/time entered by an ADEC representative. Once a test record is located, the ADEC representative must be allowed to review the previous test records as well as those that follow the target record.

w. **State Menu Access**
The EIS application software must be designed to include a State Menu as indicated in Section 3. Access to the State Menu will be by the entry of the weekly state access code. This code shall be changed weekly per the appropriate password algorithm.

x. **EIS Startup**

1. The operating system and application software must automatically load when the EIS is powered up, without requiring a manual launching by the I/M mechanic.

2. Upon completion of the system diagnostics, the application software must present the operator with an EIS menu.

3. If the EIS fails system diagnostics, the EIS shall lock down and display an appropriate error message.

y. Lockout Notification
The analyzer must alert the operator of any lockout situation by prominently displaying a message on the screen.

z. High Throughput Testing Capability
The EIS must be designed so that it is capable of testing at least four (4) vehicles per hour.

aa. Preliminary I/M Test Data Entry

1. The EIS must validate data entry elements described below:

A. RRN: A single entry is required, validated by an ADEC-provided check digit algorithm. The RRN may be blank for either out-of-state vehicles or if the RRN is unavailable. A test may not proceed unless the RRN is valid or blank.

B. VIN: A double entry is required. The VIN must be between 4 and 17 digits in length.

C. License: A single entry is required. The license number must be between 2 and 6 characters in length.

2. Double entry is defined as follows:

A. The I/M mechanic shall enter the value on the screen and when data entry is completed press the <ENTER> key to continue. The typed characters must be displayed on the screen as they are typed.

B. The analyzer must then blank the field and require the I/M mechanic to re-enter the value without the benefit of seeing the first entry. The typed characters must again be displayed on the screen as they are typed.

C. At the completion of the second data entry, the I/M mechanic shall again press the <ENTER> key to indicate that the process is complete.

D. If the two entries do not match, then the process must begin again.

E. The I/M mechanic must be forced to enter the same value twice before the process proceeds.

bb. Pollutant Measurement
The EIS must measure vehicular emissions of hydrocarbons (HC), carbon monoxide (CO), carbon dioxide (CO_2) and oxygen (O_2).

cc. **Engine RPM Measurement**
The EIS must measure RPM values. RPM measurement of direct and standard ignition vehicles must be provided both through a non-intrusive RPM sensor and by connection to the OBDII port for a vehicle that is equipped with an OBDII port. A non-intrusive RPM sensor is one that does not require any physical connections to be broken to obtain a reading. The analyzer must be able to measure engine speed on all OEM-equipped vehicles at the time of certification. Engine RPM bypass capability must be allowed for referee I/M mechanics.

dd. **Exhaust Dilution Correction**
The EIS must determine and correct for exhaust dilution.

ee. **Capability Access OBDII Readiness and Fault Codes**

1. The EIS must have the ability to access the on-board diagnostics (OBDII) system on all 1996 and newer model year vehicles.

2. The analyzer manufacturer must develop provisions for reading readiness and fault codes contained in vehicle on-board computer systems using the OBDII Link. The EIS must prompt the I/M mechanic to access the vehicle's OBDII port. After the I/M mechanic connects to the OBDII port, the EIS must decode any existing readiness and fault codes, display the results on the screen, and print a short description of the codes and the applicable OBD test results on the VIR.

ff. **Manual Testing Mode**

1. The analyzer system must be capable of being switched to an operations mode that will allow the analyzer system to be operated as an emissions analyzer for general automotive repair work and diagnostics.

2. If an attempt is made to switch the analyzer system over to the diagnostic mode during an I/M inspection the command must be ignored.

gg. **Training Test**
The analyzer must contain a training feature that will allow either an I/M mechanic or a student to complete the inspection procedure and generate a "training" VIR.

1. VIRs that are generated during training tests must indicate that they are for training purposes only and that they cannot be used for certification.

2. The word "VOID" must be printed in large letters on the face of the training VIR and

the overall result must not be printed on the VIR.

3. The training feature must neither require the use of an I/M mechanic's access code nor allow access to secured areas of either the hardware or the software of the EIS.

4. The display must show a message throughout the inspection procedure that this is a training exercise and not a test for certification.

5. The inspection record for training tests must <u>not</u> be stored in the EIS and EISHST tables.

6. The training test must contact the VID in the same manner as a normal test.

hh. Vehicle Repair and Diagnostics Application
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1. The analyzer's primary purpose is to run the emissions inspection process and to record test data in accordance with this specification.

2. The manufacturer may offer a diagnostics and repair software application program as an option to the analyzer purchaser. ADEC will allow methods for diagnosing or repairing components or systems provided that they must in no way interfere with the emissions inspection.

3. As an option, the analyzer manufacturer may include a mechanism whereby the system may obtain access to off-site repair information systems requested by the purchaser using the telephone modem contained in the analyzer system so long as it does not interfere with inspection functions.

ii. Diagnostic Functions

The vendor may submit to ADEC for approval a proposal to offer a vehicle diagnostics and repair software application option.

SECTION 2 – SOFTWARE FUNCTIONS

PURPOSE: This section describes the software functions of the Alaska2000 Emissions Inspection System (EIS).

2.1 GENERAL

a.   **The microcomputer software must control the inspection sequence and equipment processes.**

b.   **The software, at a minimum, must require the I/M mechanic to proceed in the following sequence when performing a vehicle inspection:**

   1.   enter the I/M mechanic access code;

   2.   enter required vehicle identifiers: RRN, or VIN, and License number;

   3.   attempt to retrieve vehicle information from the VID;

   4.   conduct the visual and functional inspection and enter the results;

   5.   place the non-intrusive RPM sensor on the engine or connect the EIS to the OBDII port;

   6.   perform the OBDII inspection if applicable;

   7.   perform the exhaust emissions inspection if applicable; and

   8.   when the inspection of the vehicle is complete, print the I/M mechanic information, vehicle identification information and the inspection results on the Vehicle Inspection Report (VIR) and transmit it to the VID.

2.2 I/M MECHANIC ACCESS PROCEDURE

a.   **To initiate an official I/M test, the mechanic must enter the mechanic's five-digit access code.   The mechanic must not be required to enter the mechanic license number.**

b.   The mechanic's access code must not be displayed or printed at any time by the EIS.

c.   The local I/M program office will assign the mechanic's access code number.

d.   The software must be designed to compare the I/M mechanic's access against the local TECH table values.

e.   The analyzer software must be designed to automatically deny access if the I/M mechanic:

   1.   has an expired license, based on the expiration date in the TECH table;

   2.   is listed as "locked out" from testing; or

   3.   is not listed as an I/M mechanic certified for the current EIS.

2.3   APPLICABLE MODEL YEARS

a.   The EIS must not accept any vehicle older than the model year specified in the REGION table for an inspection.

b.   An attempt to enter a model year earlier than the value specified in the REGION table must cause the EIS to display "DO NOT TEST VEHICLES OLDER THAN YYYY" and the analyzer must abort the inspection. The test record must be automatically written with an abort code of "13."

2.4 VEHICLE BODY TYPE

Vehicles tested in Alaska fall into the following classifications:
   (1) SEDAN
   (2) STATION WAGON
   (3) PICKUP
   (4) SPORT/UTILITY VEHICLE
   (5) MINIVAN
   (6) FULL-SIZE VAN.

2.5 VEHICLE MAKE ENTRIES

a. **The analyzer software shall be designed to accommodate all vehicle make names.**

b. **The software shall be designed to first display a list of vehicle makes**. The I/M mechanic shall then be instructed to select a vehicle make either by using the cursor and scrolling through the list, by typing in the first letter or two of the vehicle make so that the cursor goes directly to the first vehicle make with that letter, or by a combination thereof.

c. **The vehicle make must be printed on the VIR and recorded in the test record.**

2.6 VEHICLE MODEL ENTRIES

a. **The analyzer software must be designed to accommodate all vehicle model names.**

b. **The software must be designed to display a list of vehicle models based on the make selected**. The I/M mechanic must then be instructed to select a vehicle model either by using the cursor and scrolling through the list; by typing in the first letter or two of the vehicle model so that the cursor goes directly to the first vehicle model with that letter; or by a combination thereof.

c. **The vehicle model must be printed on the VIR and recorded in the test record.**

2.7 ENGINE RPM DETECTION

a. **Prompts must be provided to instruct the I/M mechanic regarding the placement of the non-intrusive RPM sensor or regarding the proper method of obtaining an RPM reading from the vehicle currently being tested.**

b. **The analyzer must have a response time of 0.5 seconds and an accuracy of +/- 10 RPM.**

c.   The analyzer must have the ability to obtain RPM readings from a spark plug wire pickup, a non-intrusive pickup, and from an OBDII interface connection. Each pickup and connector must be provided with the analyzer at the time of certification by ADEC.

2.8 DUAL EXHAUST

a.   For vehicles with dual exhaust, a dual sample probe of a design certified by the analyzer manufacturer must be used to provide equal flow in each leg.

b.   The equal flow requirement is met if the flow rate in each leg of the probe is measured under two sample pump flow rates (the normal rate and a rate equal to the onset of low flow) and if the flow rate in each of the legs are found to be equal to each other (within 15% of the flow rate in the leg having lower flow).

2.9 EMISSION STANDARDS

a.   Based on the vehicle information entered, the EIS must choose the proper Emission Standards Category (ESC) (see Section 3 & 4 and Appendix B) for the vehicle being tested.

b.   Emission standards must be selected on the basis of vehicle year, vehicle body type, GVWR and number of cylinders.

c.   The emission standards for the test must be contained in the ESC table.

d.   Each vehicle Emission Standards Category must contain HC and CO cutpoints.

e.   Emission standards category values and the criteria for selecting categories must be designed in a manner that allows for easy modification or addition.

2.10 DILUTION CORRECTION
The EIS must refer to the ESC table for $CO + CO_2$ dilution thresholds. If a specific threshold is unavailable in the ESC table for the vehicle being tested, the EIS must use a default value of six percent (6%).

2.11 BLIND TEST
Once the emissions analysis has begun, no test results may be displayed until after the test record is written to disk and a final pass/fail determination has been made. However, if the test is aborted, the analyzer must print "INCOMPLETE INSPECTION" on the VIR.

2.12 DATA STORAGE AND RECALL CAPABILITY
The analyzer must have the capability to store and recall a minimum of 500 emission tests and associated records.

2.13 WARRANTY MESSAGE ON VIR

a. **On 1995 and newer vehicles, emission control components may be covered by warranties mandated by federal law**. Most emission related defects are covered for two years or 24,000 miles. Specified major emission control components such as catalytic converters and the powertrain control module (PCM) are warranted for eight years or 80,000 miles or in accordance with Clean Air Act Amendments.

b. **The analyzer must print on the VIR, and display the following message for applicable vehicles (refer to Appendix D)**:

CHECK WITH THE AUTHORIZED DEALER FOR EMISSION CONTROL WARRANTY DETAILS. ALL VEHICLES THAT MAY BE ELIGIBLE FOR WARRANTY REPAIR SHOULD BE REFERRED TO THE AUTHORIZED DEALER.

2.14 DECISION CRITERIA
The EIS must be programmed to make a pass/fail determination based on test data inputs and emission results. The EIS must also be programmed to print the vehicle inspection report and store the test results. See, for example, the sample VIRs in Appendix D.

2.15   VID COMMUNICATIONS PROCESSES

All phone/modem call activities, including transactions and data files, must be handled by ADEC provided communication software in accordance with the functional specifications for the Alaska communications interface with the VID.

2.16   RECEIVE SYSTEM DATE/TIME UPDATE

a.   **The ADEC-provided VID communications element will synchronize the analyzer date/time with the VID.**

b.   **The inspection start date and time stamp for an emissions inspection must be set in the test record following the receipt of the system date/time update by the analyzer just after the initial VID contact**. **If communication attempts fail for the initial VID contact, the date and time stamp must be set using the appropriate analyzer system clock settings.**

2.17   LOCKOUT PROCESSING

a.   **The lockout status (on/off) must be transmitted to the VID and subsequently from the VID upon initial contact during a test**. **If a lockout is set, then subsequent emissions inspections must be prohibited until the applicable lockout has been cleared. Lockouts received from the VID during a Begin Test communications session must lockout all subsequent inspections. This is to avoid motorist inconvenience.**

b.   **The analyzer must lockout from emissions testing when there is no VID connection within the maximum number of off-line inspections performed or if the specified maximum number of days has elapsed**. The values for maximum tests and maximum number of days are stored in the STATION table and can be adjusted for each station by either ADEC or the local I/M Program representative. The maximum number of days is a variable. The software must count the number of off-line tests in the previous maximum days time period. If the maximum number of off-line tests has not been exceeded the software must allow new emissions inspections.   If this lockout is set by exceeding the offline test number, the analyzer must make subsequent contact with the VID. If subsequent contact is made and all stored records are uploaded to the VID, the lockout must be removed by the EIS. The off-line test count must be reset to zero.

2.18   RECEIVE ADEC OR LOCAL I/M PROGRAM MESSAGES

a.   **ADEC or local I/M Program messages must be transmitted by the VID to the analyzer**.

b.   **The full message text must be visible when displayed on the screen or printed to the printer. The analyzer must "word-wrap" all individual message lines that exceed the available display width on the screen or printer.**

c.   **A button on the main menu must appear when pending messages are waiting. This message must not appear when no messages are waiting. Messages must not be displayed during the test or upon a data file refresh — they are only to be accessed from the main menu.**

d.   **The analyzer must display ADEC or local I/M Program messages on the screen and must always print a copy of the message to the printer. A prompt for the option to print additional copies must also be provided.**

2.19   UPDATES TO VEHICLE REFERENCE TABLE (VRT) AND EMISSION STANDARDS CATEGORY (ESC) TABLE

a.   **ADEC will supply the Vehicle Reference Table (VRT) and periodic updates**. The VRT provides vehicle emissions component information, test sequence selection information and OBD connection location information to assist the mechanic in performing the inspection or test.

   1.   The manufacturer must integrate the information from the VRT into the analyzer software so that the proper emission standards and testing parameters are used (in accordance with the specifications and cutpoints defined in ESC table) during the inspection process.

   2.   The manufacturer must provide a method for service personnel to refresh the VRT should the analyzer files become corrupted.

   3.   The full VRT file must be downloaded for each update. Upon download of a VRT file, the local VRT version should be adjusted to ensure that the VRT is only downloaded when necessary.

b. **Two Speed Idle Emission Standards File**. The analyzer must receive the entire ESC table (not individual records), if applicable, from the VID for use during an emissions inspection. If the analyzer receives a new ESC table, this table must remain in use by the analyzer until such time as a subsequent version is received.

2.20   RECEIVE UPDATES OF ANALYZER LOCKOUT STATUS

a. **The status (on/off) of State and Tamper lockouts not yet sent to the VID must be transmitted to the VID, and subsequently from the VID during every inspection logon and upon request by the analyzer (VID Lockout Update menu item)**. The VID must return the current state of the State and Tamper lockout conditions.

b. **If a lockout(s) is set, then a subsequent emissions inspections must be prohibited until the applicable lockout(s) has been cleared**.

  1. The current inspection can proceed.

  2. Lockouts received from the VID during a Begin Test communications session must lockout all subsequent inspections after the current inspection in process to avoid motorist inconvenience.

2.21   RECEIVE I/M MECHANIC DATA

a. **When an I/M mechanic table (TECH) for a station is updated on the VID, the complete updated I/M mechanic table must be transmitted by the VID to the analyzer.**

b. **This file must contain the I/M mechanic license information, including name, license number, access code, lockout status and expiration dates.**

c. **The EIS software must not allow changes to the TECH table from the EIS. I/M mechanic information may only be changed from the VID.**

d. **Upon receiving data from the VID, if the license number of the I/M mechanic who is performing the current emissions inspection has been deleted or locked out, the EIS must still allow the I/M mechanic to complete the current inspection or test**.

2.22   RECEIVE SYSTEM DATA

   a.   **When the REGION table is modified on the VID, the complete updated file must be transmitted by the VID to the analyzer.**

   b.   **This file is used to define and set analyzer or inspection parameters for various analyzer settings such as calibration frequency, preconditioning time, OBD settings, etc.**

   c.   **The analyzer software must utilize the values in this file for each defined variable.**

   d.   **Because some analyzers are never turned off, the software must be capable of resetting the values contained in the REGION table, whenever the analyzer receives a new table.**

2.23   GAS CALIBRATION AND LEAK CHECK FREQUENCY
         The EIS must perform a gas calibration and a leak check whenever specified by the STATION table. The frequency of gas calibration must be adjustable by ADEC based on statistical analysis of calibration data. The frequency of gas calibration must be adjusted in the STATION table values, which are sent to analyzers from the VID.

2.24   HARD DISK WARNING MESSAGE
         When data is being stored or accessed, a message or icon must be displayed indicating that the disk is in operation and the analyzer must not be moved or otherwise disturbed.

2.25   PRINT SCREEN CAPABILITY

   a.   **The EIS must have a print screen feature, which will print any current text screen by depressing no more than three keys**.

   b.   **Print screen output must be directed to the attached printer.**

   c.   **The print screen function must be enabled during the emissions inspection process.**

2.26   ABORTED TEST RECORDING

Actual aborted records must be recorded in the EIS and EISHST tables. The abort reason and all available test data at the time of the abort must be recorded in the test record.

SECTION 3 – DISPLAY AND PROGRAM REQUIREMENTS.

PURPOSE: This section describes the computer screen displays and the software programming requirements of the Alaska2000 Emission Inspection System (EIS).

3.1 GENERAL DESCRIPTION
This subsection describes the display prompts and programming criteria for the emissions inspection procedure. The manufacturer may propose, for ADEC approval, an alternative methodology for the presentation of information and data entry as long as the substance and the priority of the sequence is not modified**.**

    a. **The EIS manufacturer must implement the following features to make the analyzer more user friendly:**

        1. implement a consistent method for returning to the previous menu;

        2. direct cursor addressing or first letter selection in combination with a scrolling display;

        3. data entry of the bar coded Vehicle Identification Numbers (VIN) and Registration Renewal Numbers (RRNs) via a bar code scanner;

        4. clear and concise data entry error messages;

        5. help screens to assist I/M mechanics with data entry; and

        6. other such options, that may be proposed for approval by ADEC.

    b. **Data entry from one item to another shall not proceed until a valid entry has been made.** Vehicle identification information, as well as the visual and functional underhood tests performed when applicable, will determine the appropriate emissions test sequences for the vehicle being tested. Once the emissions inspection has been initiated, the I/M mechanic must be prohibited from editing any vehicle identification or visual/functional inspection information. Where editing is allowed, the I/M mechanic must have the ability to return to a previous display prompt without depressing more than 3 keys. At that point, the I/M mechanic must see the prior information and be permitted to insert and delete characters without having to retype the field. This edit capability must not, however, be capable of being used to either (A) back out of a test without causing a test record to be created; or (B) delete completed visual or functional test results before completing the remainder of a test, thereby generating a VIR and test

record that has neither a visual nor a or functional test result (on tests requiring visual and functional test procedures).

c. **Unless otherwise specified in the programming criteria of this rule, the analyzer must display an appropriate error message in response to an invalid or missing entry by an I/M mechanic and must request that the mechanic re-enter the data.**

d. **The analyzer must indicate that data entered using either the keyboard or a bar code scanner was successfully entered/scanned and immediately display the data for the operator to review**. Subsection 3.2 of this Part I specifies menus the manufacturer must provide. The manufacturer may break the menus down further to increase user friendliness or expedite certain operations. ADEC may require modification of any menu it determines does not meet the minimum requirements.

e. **EIS units may not have buffered keys.**

f. **Data contained in memory will be written to disk, unless otherwise specified in the document, at the following points in the test procedure:**

   1. after completion of the inspection, following determination of pass or fail;

   2. after entry of Repair Information, if a Retest was performed;

   3. after the sticker number is confirmed or entered, if the vehicle passed the inspection; and

   4. upon test abort.

   The preceding four items are minimum requirements. If a manufacturer wishes, additional file writes will be allowed.

3.2 MENU OVERVIEW

a. **Main Menu**
   When the analyzer is turned on, the analyzer must prompt the I/M mechanic to perform any required analyzer maintenance (for example, the 72-hour gas calibration and leak check). After the operator has performed the necessary analyzer maintenance, the analyzer screen must display the following:

1) EMISSIONS INSPECTION MENU
2) OPERATOR TRAINING
3) DIAGNOSTIC FUNCTIONS
4) STATION MENU
5) STATE MENU
6) MANUFACTURER SERVICE MENU

Activation of Menu Items. The analyzer must allow the I/M mechanic to activate the Vehicle Emissions Inspection option by entering a "1," the Diagnostic Functions by entering a "3," and so forth (or the functional equivalents approved by ADEC). Other menu structures may be submitted to ADEC for approval.

b. Emissions Inspection Menu

1) OFFICIAL I/M TEST
2) ANALYZER MAINTENANCE
3) MANUAL TEST MODE
4) VIR REPRINT/TEST RECORD SEARCH

c. Diagnostic Functions Menu
The manufacturer may offer a diagnostics and repair software application to the analyzer purchaser. The scope and limitations of these applications are described in Section 1.

d. Station Menu

1) STICKER USAGE REPORT
2) VID COMMUNICATIONS DIAGNOSTICS
3) VID DATA REFRESH
4) LOCKOUT UPDATE
5) LOAD STICKERS
6) ENTER DAMAGED/MISSING STICKERS
7) ISSUE REPLACEMENT STICKERS

e. State Menu

1) ANALYZER MAINTENANCE
2) GAS AUDIT
3) VIEW STATION INFORMATION
4) INSTALL NEW DATA DISK
5) LOCKOUTS
6) PERFORM SOFTWARE UPDATE

f. Manufacturer Service Menu
The Manufacturer Service Menu must list procedures that are available only to manufacturer's representatives. The selection of "6" from the Main Menu must cause the analyzer to display the Manufacturer Service Menu. Security for this menu option will be provided by the manufacturer. The manufacturer must describe in writing to ADEC's satisfaction how this security will be implemented. The Manufacturer Service Menu option must be accessible upon power-up of the EIS. However, the ability to calibrate the analyzer must not be available until the analyzer is at a proper operating temperature. The Manufacturer Service Menu is described in section 3.7.

3.3 VEHICLE EMISSIONS INSPECTION (Item 1 of Main Menu).

3.3-1 OFFICIAL I/M TEST (Item 1 of the Vehicle Emissions Inspection Menu).

I. GENERAL REQUIREMENTS
An Official I/M Test sequence must be initiated by an entry of "1" from the Vehicle Emissions Inspection Menu. This subsection describes the programming criteria and the sequence of menus used in the Vehicle Emissions Inspection.

a. VID Connection
Immediately after selection of the Official I/M test menu option, the analyzer must test the connection to the VID as part of a background process. The analyzer must disconnect from the VID upon completion of the test.

b. EIS Gas Calibration
The EIS must not allow entry into the OFFICIAL I/M TEST Menu unless the EIS has passed a calibration test within the time specified in the STATION table. The EIS will use BAR97 gases and a zero air generator to provide a zero measurement.

c. Check for Lockouts

1. Programming Criteria:
The EIS must confirm that no lockout indicators have been set. If a lockout indicator is present a lockout message must be displayed, the procedure aborted and the system will returned to the Main Menu.

2. Suggested Display Messages:

YOUR I/M MECHANIC LICENSE HAS BEEN LOCKED OUT FROM EMISSIONS TESTING. CONTACT THE LOCAL I/M PROGRAM OFFICE FOR FURTHER INSTRUCTIONS.

THIS ANALYZER IS LOCKED OUT FROM EMISSIONS TESTING. THE STATION LICENSE HAS BEEN LOCKED OUT. CONTACT THE LOCAL I/M PROGRAM OFFICE FOR FURTHER INSTRUCTIONS.

THIS ANALYZER IS LOCKED OUT FROM EMISSIONS TESTING. A LOCKOUT HAS BEEN SET DUE TO FAILURE TO COMMUNICATE WITH THE VID. THIS ANALYZER HAS EXCEEDED THE ALLOWED NUMBER OF INSPECTIONS/DAYS WITHOUT A MODEM CONNECTION. CONTACT THE LOCAL I/M PROGRAM OFFICE FOR FURTHER INSTRUCTIONS.

THIS ANALYZER IS LOCKED OUT FROM EMISSIONS TESTING. A LOCKOUT HAS BEEN SET DUE TO A TAMPER OR OTHER ANALYZER PROBLEM. YOU MAY NEED TO CONTACT THE MANUFACTURER FOR SERVICE.

d. Abort Procedure

1. Programming Criteria:

A. Aborts must be allowed at any time until the analyzer has made an overall test pass/fail determination during an official IM test. A mechanic must be able to abort the inspection by pressing the "Escape" key.

B. Upon receiving an abort command, the EIS must display the following message:
ARE YOU SURE YOU WANT TO ABORT THIS TEST? (Y/N)

C. If the technician enters "Y," the EIS must immediately abort the inspection.

D. The I/M mechanic must then be prompted to select an appropriate abort code indicating the reason for aborting the test.

Display Prompt:
SELECT THE CODE THAT BEST DESCRIBES THE REASON THE TEST WAS ABORTED.

ABORT CODES

1) OIL SYSTEM LEAK OR WARNING LIGHT ON
2) TRANSMISSION LEAK
3) COOLANT SYSTEM LEAK OR WARNING LIGHT ON
4) FUEL SYSTEM LEAK
5) EXCESSIVE EXHAUST SYSTEM LEAK
6) EXHAUST INACCESSIBLE
7) SAMPLE DILUTION
8) ENGINE RPM TOO HIGH

    9) ENGINE RPM TOO LOW
   10) EXCESSIVE ENGINE NOISE
   11) MAINTENANCE WARNING LIGHT ON
   12) SAFETY PROBLEMS ON VEHICLE
   13) VEHICLE DOES NOT REQUIRE INSPECTION
   14) BMW/PEUGEOT/VOLVO AUTOMATIC TRANSMISSION
   15) REFEREE REFERRAL
   20) OTHER (INDICATE REASON ON THE VIR)

E. The VIR must be clearly identified as an "INCOMPLETE INSPECTION" (see Appendix D for sample VIR). If an inspection is aborted during a tailpipe emissions test, the EIS must print "ABORTED" in place of the emission readings and emission results (HC, CO, CO_2 and O_2) on the VIR.

F. If the "20"or "Other" abort code is selected, the EIS must prompt the mechanic to enter a description of the abort. The EIS must allow for a description of between 10 and 100 characters in length. The description must be printed on the VIR. While a code "20" abort must be recorded in the test record, the reason must not be recorded.

G. The actual aborted test record must be recorded in the EIS file.

   i.   In addition to the abort code, all data entered in, or obtained by, the EIS prior to the abort must be included in the EIS test record.

   ii.   Aborted test records must be stored and transmitted to the VID as part of the EIS file.

II. TEST INITIATION/VEHICLE DATA ENTRY

a. Access Code Entry

1. When the OFFICIAL I/M TEST option is selected from the Main Menu, the operator must be prompted to enter the operator's five-digit access code (the analyzer must attempt to contact the VID in the background immediately after the official I/M test option is selected). The access code must be manually entered. No mechanic ID cards will be available for scanning this information.

2. Display Prompts:

    ENTER YOUR MECHANIC ACCESS CODE.

3. The analyzer must search the TECH table containing the authorized I/M mechanics for a matching access code. If the following conditions are met the test may proceed:

    A. the access code must match one presently stored in the TECH table; and

    B. the I/M mechanic certificate status must be "C."

4. Certificate status is shown as C=Certified, D=Decertified, E=Expired, and S=Suspended. If a status other than "C" is found, the appropriate error message will be displayed and the analyzer will return to the main menu. No access code retries will be permitted. If an "Invalid access code" error occurs, the mechanic may enter the access code again for a maximum of three attempts. After the third failed access code entry, the analyzer will return to the main menu.

5. Error Messages:

    INVALID ACCESS CODE - TRY AGAIN.
    YOUR LICENSE STATUS IS <DECERTIFIED EXPIRED, SUSPENDED> –
    CONTACT THE LOCAL I/M PROGRAM OFFICE.

b. Test Type

1. Display Prompts:

SELECT THE TEST TYPE:
    INITIAL
    AFTER REPAIRS
    REFEREE

2. Programming Criteria:

    A. A test type of "I," "A," or "R" must be recorded in the test record.

    B. Referee tests (type "R") must only be displayed and restricted to access by specially licensed Referee I/M mechanics (with license type "R"). Regular mechanics (type "M" or "A") must be allowed to see and select only a type "I" or a type "A" test.

    C. When a Referee test is selected, the software must allow the referee I/M mechanic to select any of the alternate fuel types specified in 3.3-1, II, f.11 of this Part I without causing the test to abort. The fuel type selected must be stored in the test record. Alternate fuel types may also be selected for an "I" or "A" test if the mechanic classification type is "A." (See TECH table).

    When a Referee test is selected, the software must allow the referee I/M mechanic to override the decision criteria for issuance of a certificate. This includes RPM limits, dilution thresholds, test results and deviations in test procedures requiring referee intervention. The referee I/M mechanic must have

the option within the inspection mode to individually bypass RPM limit checking, dilution threshold checking, and the vehicle-preconditioning portion of the test. The referee override functions must not require access to a separate menu and should be accessible without depressing more than one key. If the referee I/M mechanic overrides the RPM or dilution limits checking during the inspection, the current test mode must be restarted. A separate override command must be required for the idle and 2500 RPM portions of the emissions test. After the OBDII inspection is performed on OBDII equipped vehicles, and before final results, the referee must be given the option to test for vehicle tailpipe emissions. After the inspection mode and before final results, the referee I/M mechanic must be given the option to override the overall test pass/fail decision. At such time, a summary screen must display the results for the following fields defined in the EIS record with the option to override the "Overall Test Result" field, "Overall Emissions Result," "OBDII Test Result," "Funct. Test Result," "Visual Test Result," and "Overall Test Result." The test record must reflect when the referee override option is exercised.

D. For Referee tests, the analyzer must display the vehicle's failure mode(s) (e.g., excess emissions, missing ECS components, functional failures) at the end of the I/M test, and must then display the following prompts:

i.   DOES THE VEHICLE MEET THE MINIMUM REQUIREMENTS FOR CERTIFICATION, EVEN THOUGH IT FAILED THE INSPECTION? (Y/N).

ii. If the referee I/M mechanic enters a "Y:"

(01) The referee I/M mechanic chooses to issue a certificate regardless of a failed test result and the analyzer must initiate the certificate printing routine in accordance with the requirements of this section. The VIR must indicate REFEREE OVERRIDE under the Overall test Results section when any override function is invoked during a Referee test.

(02) Display Prompt:

YOU HAVE INITIATED AN OVERRIDE FOR ONE OR MORE DEFECTS OR FAILURES ON THIS VEHICLE. NOTE THE OVERRIDE REASON FOR CERTIFYING THIS VEHICLE:

(03) Programming Criteria:

(a) The EIS must allow the referee to type in the reason for the referee override between 10 and 100 characters in length and the reason must be printed on the VIR.

(b) The reason for the referee override must not be recorded in the test record.

      iii.   If the Referee I/M mechanic enters an "N," the analyzer must fail the vehicle for the appropriate reasons and no certificate will be issued.

3. Error Messages:

      INVALID ENTRY – TRY AGAIN.

c. **Data Entry for Vehicle Identification**

1. Registration Renewal Number Entry.

2. Display Prompt:

      IS A REGISTRATION RENEWAL NUMBER (RRN) AVAILABLE FOR THIS VEHICLE? (CHECK THE REGISTRATION RENEWAL NOTICE OR A PREVIOUS VIR) (Y/N)

3. Programming Criteria:

    A. If No, record a blank RRN and proceed to VIN Entry.

    B. If Yes, the RRN must either be scanned (see Appendix A) from the DMV Registration Renewal Form (see Appendix A) or a previous VIR, or manually entered by the I/M mechanic. The following message must be displayed: SCAN THE RRN BAR CODE. IF THE RRN CANNOT BE SCANNED, ENTER IT MANUALLY.

4. Programming Criteria:

    A. The RRN will be validated after data entry using a check digit algorithm provided by ADEC.

    B. The RRN must be 8 digits in length and include only numeric digits.

    C. If the RRN check digit is correct, proceed to 3.3-1, II, e. of this Part I (VID Communications) below. The license plate number and VIN will be obtained from the VID.

    D. If the RRN check digit is not correct, display the appropriate error message.

    E. If the mechanic is unsuccessful after three attempts to enter the correct RRN, record a blank RRN and proceed to 3.3-1, II, d.1. of this Part I (VIN Entry).

5. Error Messages:

      INVALID RRN – TRY AGAIN.

d. Data Entry if no RRN

1. VIN Entry.

    A. Display Prompts:

    SCAN THE VIN BAR CODE FROM THE VEHICLE, THE REGISTRATION
    RENEWAL NOTICE, OR PREVIOUS VIR. IF THE VIN CANNOT BE SCANNED,
    ENTER IT MANUALLY.
    RE-ENTER THE VIN.

    B. Programming Criteria:

      i.   If the RRN is not successfully entered or is not available, the VIN must
          either be scanned or manually entered twice by the I/M mechanic. If the
          VIN is successfully scanned, a double entry is not required.

      ii.   For manual entry, display the VIN on the screen as it is being entered on the
          keyboard, and allow for its review and edit. When the mechanic strikes the
          "enter" key, the VIN must disappear from the screen and the mechanic must
          be prompted to re-enter the VIN again. If the second entry does not match
          the first, an appropriate error message must be displayed and the VIN data
          entry process must start over.

      iii.   The test must not proceed until the VIN is correctly entered. If the "dual-
          entered" VIN does not match after 3 manual attempts, the EIS must
          automatically abort the inspection procedure. No record will be written and
          no VIR will be printed by the EIS.

      iv.   Only A-Z and 0-9 will be accepted as valid characters. Spaces and other
          "special" characters are not permitted.

    C. Error Messages:

    VIN ENTRIES DO NOT MATCH -– TRY AGAIN.
    SPACES AND SPECIAL CHARACTERS ARE NOT PERMITTED — TRY AGAIN.

2. License Plate Number Entry

    A. Display Prompt:

    MANUALLY ENTER THE ALASKA LICENSE PLATE NUMBER. IF THE
    VEHICLE HAS NO LICENSE PLATES, OR HAS OUT-OF-STATE LICENSE
    PLATES, ENTER "OS."

      B. Programming Criteria:

         i.   If the mechanic enters "OS," the EIS must recognize the vehicle as an out-of-state or unlicensed vehicle and automatically add the last six (or the maximum number, if less than six) characters of the VIN entry, specified in 3.3-1, II, d.1. of this Part I (VIN Entry), to the license plate entry following the OS characters. Only "OS" will be displayed on the license plate entry screen — the full "OS" plus VIN value will not be displayed on the screen. However, the full license plate entry for the vehicle ("OS" plus VIN characters) must be recorded in the vehicle inspection record and printed on the VIR by the EIS.

        ii.   The test must not proceed until a license plate number is properly entered.

        iii.   License plates entered as '0S' will automatically be converted to 'OS.'

        iv.   Out-of-state license number entries must be eight characters in length total.

        v.   Alaska vehicle license plate number entries are 2 to 6 characters in length.

        vi.   Only A-Z and 0-9 will be accepted as valid characters. Spaces and other special characters are not permitted.

      C. Error Messages:

      SPACES AND SPECIAL CHARACTERS ARE NOT PERMITTED — TRY AGAIN
      THE LICENSE PLATE MUST BE BETWEEN 2 AND 6 CHARACTERS IN LENGTH
      – TRY AGAIN.

   e. VID Communications

   1. The EIS must automatically initiate appropriate VID interfaces (per the separate VID Communications Specification document) immediately after successful entry of the RRN, or the Alaska vehicle license plate number and VIN, of the vehicle to be inspected. These interfaces must be called for in every emissions inspection or test, including training tests. Immediately after the RRN or VIN/license entry, the EIS must first display any communication errors returned by the State-supplied communications module. If no communications errors exist, while waiting for vehicle and system information from the VID, the test must proceed to the entry of the odometer reading and the dual exhaust entry. If still waiting for a response from the VID after these two entries, the EIS must display the following:

      RETRIEVING DATA FROM VID. PLEASE WAIT.

      Any communications errors (including SECURITY_LOGIN problems) must be noted and resolved, if possible, *before* entry of the odometer reading and dual

exhaust entry. **Please see the data communications specification for additional information**.

Upon the successful transmittal of the Vehicle data, the EIS must process the pretest_message and the abort_test values. If the abort flag is set, the test must abort (code "80"); otherwise, the message will be advisory only. Either no message or a single message will be displayed per vehicle -- multiple messages by the EIS must not be allowed.

If no dial-tone was detected by the EIS during VID contact, a message asking the mechanic to "VERIFY THAT A FUNCTIONAL PHONE LINE IS PROPERLY CONNECTED TO THE ANALYZER" must be displayed. After an acknowledgement by the mechanic, the EIS must attempt to reconnect to the VID.

If VID contact fails for any reason, error messages will be displayed as outlined in the data communications specification. Following the error message, the following message must be displayed:

PROCEED WITH THE EMISSIONS TEST AND MANUALLY ENTER ALL VEHICLE INFORMATION.

The offline test count must increase by one for each failed VID connection attempt, regardless of the reason. The online/offline test field must be appropriately recorded in the EIS field by the EIS. The error code must also be recorded by the EIS.

If only the RRN was entered for vehicle information, the EIS must prompt the mechanic to enter the VIN and license plate number if VID contact fails or vin/license data was not returned back to the EIS by the VID.

If a VIN and license plate number were passed by the EIS to the VID, it is possible that the VID might return a different value for the license plate number or VIN as an output parameter. If either the returned VIN or license plate number is different from the passed-up VIN or license plate number, the VID is suggesting that the mechanic may have made a data entry error and, according to I/M databases, the returned values are more likely the correct value. In such a case, a special prompt must be displayed asking the mechanic to verify the correct values.

2. After successfully connecting to the VID using the State-supplied communications module, the EIS must run appropriate interfaces, as defined in the VID Communications Specification. The VID must transmit to the EIS applicable information for the vehicle under test, in addition to any other pending transactions.

f.   Manual Data Entry if No VID Connection

1. If the VID is not successfully contacted by the EIS, and only the RRN was entered
for vehicle information, the EIS must prompt the mechanic to enter the VIN and
license plate number using the data entry logic in **Data Entry if no RRN** and
License Plate Number Entry. Also, the data in specified in this 3.3-1, II, f. of this
Part I must be manually entered if the EIS fails to contact the VID. The following
data elements may be automatically entered upon a successful contact with the VID.

2. Model Year

A. Display prompts:

ENTER THE VEHICLE MODEL YEAR.

B. Programming criteria:

i.   Vehicles that are older than the "Earliest Model Year To Test" field in the
REGION table need not be inspected.

ii.   New vehicles may be exempt from testing for several years. However, the
analyzer software must not show any advisory messages that the vehicle is
not to be tested or disallow testing of the vehicle.

iii. The EIS must not accept vehicle model years greater than one year after the
current year will not be accepted.

C. Error Messages:

THIS VEHICLE WAS MANUFACTURED BEFORE YYYY AND DOES NOT
REQUIRE AN INSPECTION.
MODEL YEAR IS INVALID – TRY AGAIN.
NO VALUE HAS BEEN ENTERED – TRY AGAIN.

3. Vehicle Make

A. Display prompts:

SELECT THE VEHICLE MAKE NAME. IF THE MAKE IS NOT LISTED, TYPE IN
THE FULL MAKE NAME.

B. Programming criteria:

i.   Vehicle make names must be entered by a method approved by ADEC
which maximizes user friendliness, preferably via direct cursor selection or
the first few letters of the name.

ii.   A list, from the VRT file, of all vehicle make names for the previously
entered model year must be displayed.

(01) For example, the I/M mechanic must be able to enter the first letter of the vehicle make, causing the cursor to go to the first make on the list beginning with the same letter, which would also be highlighted.

(02) If that is the correct make, the "enter" key would then be pressed. If this is not the correct make, the I/M mechanic must then be able to move the cursor a short distance to the correct make.

(03) Duplicate make names for the same model year must not be displayed.

    iii.   A minimum of two characters must be entered to be considered a valid make name.

C. Error Messages:

    NO MAKE HAS BEEN SELECTED – TRY AGAIN.

4. Vehicle Model

A. Display prompts:

    SELECT THE VEHICLE MODEL NAME. IF THE MODEL IS NOT LISTED, TYPE IN THE FULL MODEL NAME.

B. Programming criteria:

    i.   Vehicle model names must be entered by a method approved by ADEC, which maximizes user friendliness, preferably via direct cursor selection or the first few letters of the model name.

    ii.   A list, from the VRT table, must be displayed of all vehicle model names for the previously entered vehicle model year and make name.

(01) The list must also display the Vehicle Body Type (1 – 6) alongside the model name.

(02) For example, the I/M mechanic should be able to enter the first letter of the vehicle model name, causing the cursor to go to the first model on the list, which would also be highlighted, beginning with the same letter.

(03) If that is the correct model, the mechanic would press "enter" key. If this is not the correct model, the mechanic would at least be close enough to only have to move the cursor a short distance to the correct model.

iii.   A minimum of two characters must be entered.

iv.   When the EIS performs the model search in the Vehicle Reference Table (VRT), duplicate models with a duplicate Vehicle Body Type must not be displayed. For example, for a 1978 Chevrolet, the VRT may contain several listings for "CAMARO," "CHEVELLE," or "CORVETTE." The EIS must only display each unique name and Vehicle Body Type once. This does not apply to model names that contain additional information that makes it unique. For example, the VRT may list "CORVETTE L-48" and "CORVETTE L-82." Those model listings are unique and both must be listed.

C. Error Messages:

    NO MODEL HAS BEEN SELECTED – TRY AGAIN.

5. Vehicle Body Type

A. Display prompts:

SELECT THE VEHICLE BODY TYPE
        (1) SEDAN
        (2) STATION WAGON
        (3) PICKUP
        (4) SPORT/UTILITY VEHICLE
        (5) MINIVAN
        (6) FULL-SIZE VAN

B. Programming criteria:

i.   If the vehicle model year, make and model entered by the mechanic describe a unique vehicle (i.e., a single VRT Row number), the EIS may take the body type directly from the VRT record and the I/M mechanic only needs to approve the body style type.

ii.   The Vehicle Body Type Code must be used to determine the vehicle test standards group in the ESC (Passenger Car or Truck), which will be used for determining the appropriate test standards.

    (01) Vehicle body type codes 1 and 2 will be tested as Passenger cars, while body type code 3-6 will be tested as Trucks. The vehicle body type code will be stored in the test record.

    (02) Acceptable vehicle test standards group codes are:
        (a) "P" = PASSENGER CAR.
        (b) "T" = TRUCK.

C. Error Messages:

NO BODY STYLE TYPE HAS BEEN SELECTED – TRY AGAIN.
VEHICLE TYPE CODE IS NOT VALID – TRY AGAIN.

6. Gross Vehicle Weight Rating (GVWR)

A. Display prompts:

ENTER THE VEHICLE'S GROSS VEHICLE WEIGHT RATING (GVWR) AS
INDICATED ON THE VEHICLE'S PERMANENT IDENTIFICATION PLATE.

DO NOT INCLUDE DECIMAL POINTS OR COMMAS.

IF THE GVWR IS NOT AVAILABLE AND THE VEHICLE IS A SMALL PICKUP,
SPORT/UTILITY VEHICLE, MINIVAN, OR FULL-SIZE PICKUP OR VAN RATED
AS A ½ TON (FOR EXAMPLE: GM 10 OR 15 SERIES, FORD OR DODGE 100 OR
150 SERIES), ENTER 5999 FOR GVWR. IF THE VEHICLE IS RATED AS A ¾
TON OR 1 TON (FOR EXAMPLE: GM 20, 25, OR 30 SERIES OR DODGE 250 OR
350 SERIES), ENTER 8499 FOR GVWR.

B. Programming Criteria:

i.   If either "(1) Sedan" or "(2) Station Wagon" is selected as the body type
     entry, the GVWR entry must be bypassed, and "00000" written to the
     electronic record. For all other body type entries, the GVWR is required.

ii. If the model year, make, model and body type entered describe a unique
     vehicle (i.e., a single VRT Row number), the GVWR may be taken directly
     from the VRT record and the I/M mechanic only needs to approve the
     GVWR.

iii. GVWR must be recorded in the test record and printed on the VIR for all
     trucks.

iv. For trucks, the GVWR must be in the range of 2500 to 99999 lbs.

C. Error Messages:

NO VALUE HAS BEEN ENTERED - TRY AGAIN.
GROSS VEHICLE WEIGHT RATING MUST BE AT LEAST 2500 LBS - TRY
AGAIN.

7. Vehicle Certification Type

A. Display Prompt:

CHECK THE UNDERHOOD LABEL TO SEE IF THE VEHICLE MEETS
CALIFORNIA OR FEDERAL CERTIFICATION REQUIREMENTS:

(01) ENTER A "C" IF IT'S CALIFORNIA CERTIFIED.
(02) ENTER AN "F" IF IT'S ONLY FEDERALLY CERTIFIED.
(03) ENTER AN "R" IF THE VEHICLE HAS A REFEREE LABEL.
(04) IF THERE'S NO LABEL, ENTER "N" FOR NONE.

B. Programming Criteria:

i. This entry must be used to determine required emission control systems.

ii. If the mechanic enters "NONE," the analyzer must display the following prompt:

IF THERE IS NO LABEL AND THE VEHICLE APPEARS TO BE A DIRECT IMPORT (GREY MARKET OR OTHER NON-US CERTIFIED) OR YOU ARE UNABLE TO DETERMINE WHAT ECS IS REQUIRED ON THE VEHICLE, REFER THE CONSUMER TO THE REFEREE AND ABORT THE TEST. OTHERWISE, ENTER "U" FOR UNKNOWN AND PRESS CONTINUE.

iii. The analyzer software must be designed to allow the entry of "U" (or "C" or "F") only after the above message has been displayed.

iv. The analyzer software must be designed to automatically abort the test if the mechanic enters "N" and presses "CONTINUE."

v. The analyzer software must be designed so that only "C," "F," "U," "N," or "R" can be entered by the mechanic for this field.

C. Error Message:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.
INVALID VALUE – ENTER C, F, N, U OR R – TRY AGAIN.

D. If the mechanic enters "R," the following prompt must be displayed:

ENTER THE REFEREE LABEL NUMBER, STARTING WITH A LETTER FOR THE PROGRAM AREA. IF THERE IS NO LABEL NUMBER, ENTER "N" FOR NONE, PRESS CONTINUE AND REFER THE MOTORIST TO THE REFEREE FACILITY.

E. Programming Criteria:

i. The I/M mechanic must be allowed to enter between one and eight alphanumeric characters for the referee label number.

ii. The EIS must write the referee label number to the OFFICIAL_TEST_INSERT stored procedure in the REFEREE_LABEL field.

iii. The EIS must NOT print the referee label number to the VIR.

F. Error Message:

> NO VALUE HAS BEEN ENTERED – TRY AGAIN.
> INVALID VALUE -- ENTER NO MORE THAN EIGHT CHARACTERS — TRY AGAIN.

G. Display Prompt:

> THE REFEREE HAS APPROVED THIS VEHICLE TO BE TESTED ACCORDING TO THE INFORMATION PROVIDED ON THE REFEREE LABEL. IF THE VEHICLE CONFIGURATION AND THE LABEL INFORMATION DO NOT AGREE CONTACT THE REFEREE FOR CLARIFICATION PRIOR TO PROCEEDING WITH THE TEST.

8. Number of Cylinders

A. Display Prompt:

> ENTER THE NUMBER OF CYLINDERS. FOR ROTARY ENGINES, ENTER AN "R."

B. Programming Criteria:

    i.   The minimum number of cylinders is 1 and the maximum is 16. Any entries out of the range of 1 – 16 must be rejected.

    ii.   For rotary engines, the I/M mechanic must be prompted to enter "R." The EIS must translate the entry to "4" (cylinders) in order to determine the appropriate emission standards category, however "R" will be stored in the test record.

C. Error Messages:

> NO VALUE HAS BEEN ENTERED – TRY AGAIN.
> NUMBER OF CYLINDERS ENTRY IS NOT VALID – TRY AGAIN.

9. Vehicle Engine Size

A. Display Prompt:

> ENTER THE ENGINE SIZE, FOLLOWED BY ONE OF THE FOLLOWING CODES:

CODE	DESCRIPTION
I	CUBIC INCHES
L	LITERS
C	CUBIC CENTIMETERS.

B. Programming Criteria:

i. The last character must be the unit used for the engine size, and must either be "L" for liters, "I" for cubic inches or "C" for cubic centimeters. The EIS must be designed so that only I, L, or C can be entered as the last byte. Liter size entries must be in the form of "number, decimal point, number" (X.X). The internal storage by the EIS record must automatically convert the entry into cubic centimeters. However, the display must remain in the original units entered.

ii. To convert from cubic inches to cubic centimeters, the program must multiply by 16.387. To convert from liters to cubic centimeters, multiply by 1000. Values must then be rounded to the nearest whole cubic centimeter.

iii. An error message must be displayed if the I/M mechanic enters an equivalent engine size greater than 9999 cc (equivalent to about 605 CID) or smaller than 500 cc. The I/M mechanic must be instructed to correct the entry or abort the test.

C. Error Messages:

A VALID ENGINE SIZE OR UNITS CODE HAS NOT BEEN ENTERED – TRY AGAIN.
ENGINE SIZE IS LESS THAN 500 CC – ARE YOU SURE THIS IS CORRECT?
ENGINE SIZE IS GREATER THAN 605 CID (9.9 LITERS) – ARE YOU SURE THIS IS CORRECT?

10. Transmission Type

A. Display Prompt:

SELECT THE VEHICLE TRANSMISSION TYPE:
 M = MANUAL
 A = AUTOMATIC

B. Programming Criteria:

This entry must be designed so that only "M" or "A" values are accepted by the EIS.

C. Error Messages:

NO VALUE HAS BEEN ENTERED -- TRY AGAIN.
INVALID ENTRY -- TRY AGAIN.

11. Fuel Type

    A. Display Prompt:

    SELECT THE VEHICLE FUEL TYPE:

              G   GASOLINE
              B   BI-FUELED (alternate fuel and gasoline)
              P   LIQUID PROPANE GAS (LPG)
              N   LIQUID/COMPRESSED NATURAL GAS (LNG/CNG)
              M   METHANOL (greater than 20%)
              E   ETHANOL (greater than 20%)
              D   DIESEL
              L   ELECTRIC.

    B. Programming Criteria:

    i.   The default code selection must be "G" (gasoline).

    ii.   Refer to the TECH table (Part 1, Section 4 of this document) to determine the license type of the mechanic performing the current test. The testing mechanic may be "M" (I/M mechanic without alternate fuel testing authority), "A" (I/M mechanic with alternate fuel testing authority) or "R" (Referee I/M mechanic).

    iii.   An "M" type I/M mechanic must be limited to selecting only "G" (gasoline) for fuel type. Entry of any other fuel code selections by an "M" type mechanic must cause the test to abort. The EIS must automatically assign an abort code 13 to this record.

    iv.   An "A" type I/M mechanic must be limited to selecting only "G" (gasoline), "B" (bi-fueled) and "E" (ethanol greater than 20%) fuel types. Selection of all other fuel codes must cause the test to abort. The EIS must automatically assign an abort code 13 to this record.

    v.   An "R" type Referee I/M mechanic must be allowed to select any fuel code except "D" (diesel) without causing the EIS to abort the test. Selection of "D" (diesel) will cause the test to abort for all mechanics.

    vi.   When an "E" (ethanol greater than 20%) is selected, the EIS must prompt for the same test as if a "G" (gasoline) test was selected.

    vii.   When "B" (bi-fueled) is selected:

    (01) if the model year of the vehicle is 1995 or older the analyzer must:

       (a) prompt for visual and functional tests but will disregard any input regarding the TAC system,

(b) then prompt for an alternate fuel mode tailpipe test using the dilution correction formula for compressed natural gas and the standards found in Appendix B.

(02) if the model year of the vehicle is 1996 or newer the analyzer must:

(a) prompt for visual and functional tests but will disregard any input regarding the TAC system,

(b) then prompt for an OBDII test,

(c) then prompt for a gasoline mode tailpipe test using the dilution correction formula for gasoline and the standards found in Appendix B, and

(d) then prompt for an alternate fuel mode tailpipe test using the dilution correction formula for compressed natural gas and the standards found in Appendix B.

viii. The standard abort code screen (see section 3.3-1.c) must not be displayed.

C. Display Message:

ONLY GAS POWERED AND BI-FUELED VEHICLES ARE SUBJECT TO EMISSIONS TESTING.

D. Error Messages:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.
INVALID ENTRY – TRY AGAIN.

12. Expiration month and year

A. Display Prompt:

ENTER THE VEHICLE REGISTRATION EXPIRATION MONTH AND YEAR AS CURRENTLY DISPLAYED ON THE REGISTRATION RENEWAL CARD OR LICENSE PLATE.

B. Programming Criteria:

i.   If the vehicle registration expiration month and year cannot be obtained from the VID, no default value is allowed; instead, the I/M mechanic must enter the data directly.

ii.   The I/M mechanic must not be required to enter the expiration day of the month. The actual expiration date is assumed to be the last day of the month entered.

iii.   The expiration month must always be the month that is entered.

iv.   Actual calculation of the month and year of expiration by the EIS will occur during the **Overall Pass/Fail Determination** and for a passing test only.

v.   If the expiration date (month/year) entered by the mechanic or the VID is more than 1 year earlier than the date of the test, the EIS must assign an expiration date as two years after the test date. For example, if the month/year entered by the mechanic or VID is 2/1997, and the test date is 3/1999, the expiration would be 2/2001.

vi.   If the date entered by the mechanic or the VID is less than 1 year earlier than the date of the test, the EIS must assign an expiration date as two years after the entered date. For example, if the month/year entered by the mechanic or VID is 2/1999, and the test date is 3/1999, the expiration would be 2/2001.

vii.   If the date entered by the mechanic or the VID is equal to 1 year earlier than the date of the test, the EIS must assign an expiration date two years after the date entered. For example, if the month/year entered by the mechanic or VID is 3/1997, and the test date is 3/1999, the expiration would be 3/2001.

viii.   If the date entered by the mechanic or the VID is equal to the date of the test, the EIS must assign an expiration date two years after the entered month/year. For example, if the month/year entered by the mechanic or VID is 3/1999, and the test date is 3/1999, the expiration would be 3/2001.

ix.   If the date entered by the mechanic or the VID is more than 4 months after the date of the test, the EIS must assign an expiration date equal to the entered month/year. For example, if the month/year entered by the mechanic or VID is 4/2000, and the test date is 3/1999, the expiration would be 4/2000.

x.   If the date entered by the mechanic or the VID is after the date of the test and between 1 and 4 months of the test date, the EIS must assign an expiration month/year as two years after the entered month/year. For example, if the month/year entered by the mechanic or VID is 12/1999, and the test date is 9/1999, the expiration would be 12/2001.

xi.   The EIS must not accept values more than 2 years and 3 months after than the current date. The latest acceptable month and year will be shown in the error message as indicated below.

xii.   The EIS must assign out-of-state vehicles an expiration month/year that is two years after the test date. Out-of-state vehicles are identified as those with license plate values that begin with "OS." When the EIS automatically

assigns an expiration date for out-of-state vehicles, the EIS must not allow the entry to be overridden by the mechanic.

xiii. The year must be entered and stored as four digits. The month may be entered as one or two digits, but must be stored as two digits.

xiv. The EIS-assigned expiration month/year must be printed on the certificate of inspection as shown in Appendix C.

C. Error Messages:

INVALID MONTH ENTRY – PLEASE ENTER A VALUE FROM 1 TO 12.
INVALID YEAR ENTRY – PLEASE ENTER A 4 DIGIT YEAR.
INVALID ENTRY – ENTRIES LATER THAN XX/XXXX ARE NOT PERMITTED.

g. Odometer

1. Display Prompt:

ENTER THE VEHICLE ODOMETER READING. DO NOT INCLUDE THE TENTH OF A MILE INDICATOR OR DECIMAL POINT, IF PRESENT.

2. Programming Criteria:

A. The odometer entry must be printed on the VIR and recorded in the test record as the "Current Odometer Reading."

B. The analyzer must only accept either an entry of all numerics (a minimum of one numeric entry is required if a numeric entry is made) or the word "NONE" in the odometer field. If the mechanic enters "NONE," the analyzer must translate this to "000000" for the test record, print the word "NONE" on the VIR and show the word "NONE" on the analyzer screen for the odometer field.

3. Error Messages:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.

h. Dual Exhaust

1. Display Prompt:

DOES THE VEHICLE HAVE DUAL EXHAUST? (Y) YES OR (N) NO.

2. Programming Criteria:

    A. The default value must be "N" (No). If the operator answers "N," the EIS must automatically proceed to the next item.

    B. If the I/M mechanic answers "Y" for yes, the EIS must instruct the I/M mechanic to test the vehicle with the dual probe attachment.

    C. The EIS must only allow either "Y" or "N" to be entered for this field.

3. Error Messages:

    INVALID ENTRY – TRY AGAIN.

i. Vehicle Data Entry Confirmation Screen

1. Display prompts:

REVIEW THE VEHICLE INFORMATION ENTRIES FOR ACCURACY. IF THIS INFORMATION IS CORRECT, PRESS <YES>. IF NOT, MAKE THE NECESSARY CORRECTIONS.
    MODEL YEAR
    MAKE
    MODEL
    BODY TYPE
    GVWR (WHERE APPLICABLE)
    CERTIFICATION TYPE
    CYLINDERS
    ENGINE SIZE
    TRANSMISSION TYPE
    FUEL TYPE
    EXPIRATION MONTH/YEAR
    ODOMETER
    DUAL EXHAUST

2. Programming Criteria:

    A. The EIS must display all previous entries and allow the I/M mechanic to edit the information.

    B. The software must be designed to require the I/M mechanic to confirm that previous entries are correct and that there are no blank fields before initiating the emissions test.

    C. Blank entries must not allowed, even if data was obtained from the VID.

    D. The RRN, VIN, and license plate number must be displayed at the top of the data

entry confirmation screen. However, the EIS must not allow the RRN, VIN, and license plate to be modified.

3. Error Messages:

A. Error messages must conform to messages for manual data entry procedure outlined in section f, 1-11, above.

B. "AN ENTRY IN ALL FIELDS IS REQUIRED."

j. VRT Lookup

1. Programming Criteria:

A. The software must be designed to immediately initiate a search through the Vehicle Reference Tables, as soon as information is entered, to determine the appropriate VRT row. Cutpoint information is obtained from the ESC table. No VRT lookup will be performed if a VID connection was successful and vehicle data was returned. Cutpoint information must be obtained from the ESC table based on values returned from the VID.

B. To access the Vehicle Reference Table, the EIS must search each of the following fields, in this order, until an exact match is found:

  i. Model Year,

  ii. Vehicle Make,

  iii. Vehicle Model,

  iv. Body Type,

  v. GVWR,

  vi. Number of Cylinders,

  vii. Engine Size, and

  viii. Transmission Type.

C. Engine size stored in the VRT table must be in cubic centimeters rounded to the nearest 100 cc. The value stored in the VRT table is based on liters from the EPA lookup tables. To match a value in the VRT, the EIS must round the vehicle engine size to the nearest 100 ccs. Examples of what is stored in VRT is 1600, 2200 and 5700.

D. Transmission types stored in the VRT must be "A" = Automatic, "M" = Manual and "E" = Either. A search which does not yield a match for either an A or M should match for E. The EIS must establish the VRT Row ID number for future use.

III.   VISUAL INSPECTION OF EMISSION CONTROL SYSTEMS

The visual and functional portions of the I/M test must occur for all 1995 and older model year vehicles and for 1996 and newer model year vehicles that are exempted from the OBDII test (as identified with an 'F' in the OBD Exemption Table, Test Field).

The visual and functional portions of the I/M test must occur for all vehicles, regardless of model year, on Referee tests, this includes OBDII vehicles and if there is an 'F' in the Visual_Func_Test field.

For 1996 and newer model year vehicles requiring an OBDII test and where the current test date is greater than the OBDII Failure Start date, the EIS must check the Visual_Func_Test field of the Region Table. If there is an 'F' in the Visual_Func_Test field of the REGION table, the EIS must proceed to: **IV Functional Checks of Emission Control Systems, e. OBD II Test Procedure.** If there is an 'F' in the Visual_Func_Test field, the visual and functional portions of the I/M test must be bypassed. Null values must be recorded in all of the visual and functional fields in the test record when 'F' is present in the Visual_Func_Test field.

If the EIS finds a "T" in the Visual_Func_Test field of the REGION table, a visual and function test must be performed as outlined below.

If the current test date is before the OBDII Failure Start date, the EIS must not check the Visual_Func_Test field of the Region Table. All 1996 and newer model year vehicles must have the visual and functional portion of the I/M test conducted as outlined below.

a. Display Prompt:

VISUAL INSPECTION
ENTER ONE OF THE FOLLOWING CODES FOR EACH SYSTEM:

CODE	DESCRIPTION
P	PASS
D	DISCONNECTED
M	MODIFIED
S	MISSING
F	DEFECTIVE
N	NOT APPLICABLE

1) AIR INJECTION SYSTEM (AIS)
2) POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM
3) CATALYTIC CONVERTER(S)
4) EXHAUST GAS RECIRCULATION (EGR) SYSTEM
5) FUEL EVAPORATIVE CONTROLS (EVAP)
6) OXYGEN (O_2) SENSOR
7) VACUUM HOSES AND WIRING
8) CARBURETOR/FUEL INJECTION
9) MANIFOLDS AND IGNITION
10) INTAKE AIR HEATER (TAC)
11) EARLY FUEL EVAPORATION (EFE)
12) OTHER EMISSIONS-RELATED COMPONENTS

b. Programming Criteria:

1. The visual inspection must be limited to vehicles found in the REGION table "Earliest Model Year Visual Check" field value and newer model years. Visual inspection prompts must not be displayed for older model years.

2. A "HELP" screen must be provided that advises the mechanic to refer to the vehicle's underhood emission control system label as the primary source of information to determine what the emission control devices are required on that particular vehicle.

3. A single entry must be mandatory for each visual inspection item. The analyzer software must be designed so that only "P," "D," "M," "S," "F," or "N" can be entered by the mechanic for each item.

4. Entries of the codes for each item must be made in sequence.

5. The mechanic must be required to make a positive code entry for each ECS item. The analyzer must not default to "PASS," "NOT APPLICABLE," "DEFECTIVE" or any other entry.

6. The analyzer must not allow the entry of "PASS," "MISSING," "MODIFIED" or "DISCONNECTED" codes for both "CARBURETOR" and "FUEL INJECTION." A vehicle has only one type of fuel induction system and therefore entry of "N" (for "NOT APPLICABLE") must be entered for one type of fuel induction system and "P," "D," "M," "S," or "F" for the other.

7. Edit capability must be provided for all entries prior to initiation of the emissions test.

8. The mechanic must only be allowed to enter "P," "F," or "N" to the initial prompt for the visual inspection of the Air Injection System (AIS). If the mechanic enters "P" for "ALL PASS," the analyzer must pass the vehicle for the AIS visual

inspection. If the mechanic enter "F" for FAIL, the analyzer must fail the vehicle for the AIS visual inspection. If either "P" or "F" are entered, the analyzer must display the following menu:

 PUMP AIR SYSTEM
 PULSE AIR SYSTEM.

A. The mechanic must be allowed to only select either "A" for pump air or "P" for pulse air. The character that is selected must be entered into the test record. If, after entry of an initial "P" for "ALL PASS," the mechanic enters a code that the vehicle is equipped with a pump air system, "P" must be entered by the EIS into the test record for each of the following pump air-related components:

   AIR INJECTION PUMP
   AIR PUMP BELTAIR INJECTION PLUMBING
   AIR DIVERTER VALVE.

"N" must also be entered by the EIS into the test record for each of the following components related to pump air systems:

   PULSE AIR REED/CHECK VALVES
   PULSE AIR INJECTION PLUMBING.

B. If, after entry of an initial "P" for "ALL PASS," the mechanic enters that the vehicle is equipped with a pulse air system, "P" must be entered by the EIS into the test record for each of the following components related to pulse air systems:

   PULSE AIR REED/CHECK VALVES
   PULSE AIR INJECTION PLUMBING.

"N" must also be entered by the EIS into the test record for each of the following components related to pump air systems:

   AIR INJECTION PUMP
   AIR PUMP BELT
   AIR INJECTION PLUMBING
   AIR DIVERTER VALVE.

C. After entry of an initial "F" for "FAIL" and selection of either pulse air or pump air, the appropriate sub-menu must be displayed. The mechanic must then enter the appropriate condition for each of that system's components. If the mechanic enters a code indicating that the vehicle is equipped with a pump air system, the following menu must be displayed:

   AIR INJECTION PUMP
   AIR PUMP BELT
   AIR DIVERTER VALVE
   AIR INJECTION PLUMBING.

If the mechanic enters a code indicating that the vehicle is equipped with a pulse air system, the following menu must be displayed:

  PULSE AIR REED/CHECK VALVES
  PULSE AIR INJECTION PLUMBING.

For each of the menu items that are displayed, the mechanic must select either "P," "D," "M," "S," "F," or "N" ("Not Applicable"). At least one "D," "M," "S," or "F" must be entered by the mechanic, or the following prompt must be displayed:

  YOUR INITIAL ENTRY INDICATED AN OVERALL FAILURE FOR THE AIR INJECTION SYSTEM. A "NON-PASSING" ENTRY MUST BE MADE FOR AT LEAST ONE AIS COMPONENT BEFORE YOU WILL BE ALLOWED TO PROCEED. IF YOU WISH TO CHANGE YOUR INITIAL AIS ENTRY, PLEASE HIT <NO> TO RETURN TO THE PREVIOUS SCREEN. OTHERWISE, PLEASE ENTER "D," "M," "S," OR "F" FOR AT LEAST ONE OF THE DISPLAYED COMPONENTS.

The EIS must not allow the mechanic to proceed until at least one "D," "M," "S," or "F" is entered for the displayed components. Instructions must also be displayed for the mechanic to back up and change the initial Air Injection System visual inspection entry.

D. After entry of an initial "N" for "NOT APPLICABLE," "N" must be entered by the EIS into all Air Injection System visual inspection fields.

E. If the mechanic changes the overall AIS entry after initial entry, the EIS must modify all subsequent AIS entries and test results reported on the VIR and entered into the test record to be consistent with the modified overall entry. For example, if "P" is initially entered for the AIS visual inspection, and subsequently changed to "N," all AIS test record fields must be corrected to "N" entries and "NOT APPLICABLE" must be printed on the VIR for the AIS visual inspection.

F. Error Messages:

  INVALID ENTRY – TRY AGAIN.
  BLANK VALUES NOT ALLOWED – TRY AGAIN.

IV. FUNCTIONAL CHECKS OF EMISSION CONTROL SYSTEMS

a. Display Prompt:

FUNCTIONAL INSPECTION
ENTER ONE OF THE FOLLOWING CODES FOR
EACH FUNCTIONAL CHECK PERFORMED:

CODE DESCRIPTION
P   PASS CHECK
F   FAIL CHECK
N   NOT APPLICABLE

FUNCTIONAL CHECKS
1)   EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR
2)   MALFUNCTION INDICATOR LAMP/CHECK ENGINE LIGHT (MIL)
3)   MAJOR VACUUM LEAKS
4)   POSITIVE CRANKCASE VENTILATION (PCV)
5)   INTAKE AIR HEATER (TAC)
6)   EARLY FUEL EVAPORATION (EFE)
7)   AIR INJECTION SYSTEM (AIS)

b. Programming Criteria:

1. The functional checks must be limited to the REGION table "Earliest Model Year Functional Check" field value and newer models. Functional check prompts must not be displayed for older models.

2. The mechanic must be required to make an entry for each item before proceeding. The analyzer software must be designed so that only "P," "F," or "N" can be entered by the mechanic for each functional check.

3. The entries must be made in sequence, but the mechanic may be allowed to edit previous entries at any time prior to beginning the emissions test. The analyzer must not default to "PASS," "FAIL" or "NOT APPLICABLE."

4. When the mechanic enters "P" for either the Emission Control Maintenance Light/Indicator or the Emission Control Engine Warning Light, the analyzer must display the following message:

  PASS ENTRIES INDICATE THAT THE LIGHT/INDICATOR WORKS AND SERVICE
  OR REPAIRS ARE NOT NEEDED.

5. When the mechanic enters "F" for either the Emission Control Maintenance Light/Indicator or the Emission Control Engine Warning Light, the analyzer must display the following message:

FAIL ENTRIES INDICATE THAT THE LIGHT/INDICATOR DOES NOT WORK OR REPAIRS ARE NEEDED.

A. If the mechanic indicates that the Emission Control Maintenance Light or Warning Flag is illuminated or displayed, by entering "F" for "Fail," the analyzer must display the following prompt:

DETERMINE IF THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR IS ON DUE TO SCHEDULED REPLACEMENT OR MAINTENANCE OF THE OXYGEN SENSOR. IF THE LIGHT/INDICATOR IS ON BECAUSE OF SCHEDULED OXYGEN SENSOR MAINTENANCE OR REPLACEMENT, ENTER "Y" FOR YES.

   i.   If, after entering "F" for the emission control maintenance light/flag, the mechanic determines the light/flag is on for a reason other than scheduled maintenance or replacement of an oxygen sensor and he/she enters "N" in response to the above prompt, the vehicle must be passed for this functional check, but the following message must be printed on the VIR:

THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR IS NOT FUNCTIONAL OR INDICATES THAT YOUR EMISSION CONTROL SYSTEM IS IN NEED OF A MANUFACTURER-RECOMMENDED SERVICE. MAINTAINING YOUR VEHICLE'S EMISSION CONTROL SYSTEM IS RECOMMENDED IN ORDER TO KEEP YOUR VEHICLE'S ENGINE RUNNING PROPERLY, MAINTAIN FUEL ECONOMY AND HELP REDUCE AIR POLLUTION.

   ii. If the mechanic enters "Y," signifying that the light/flag is on due to scheduled maintenance or replacement of an oxygen sensor, the vehicle shall be failed for this functional check and the following message printed on the VIR:

THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR INDICATES THAT THE OXYGEN SENSOR IS IN NEED OF SCHEDULED MAINTENANCE AND/OR REPLACEMENT. THE OXYGEN SENSOR MUST BE CHECKED AND EITHER REPLACED OR THE TIMER RECYCLED BEFORE THE VEHICLE CAN PASS THE EMISSIONS INSPECTION.

6. The I/M mechanic must be prompted to perform a key-on/engine-off check to see if the Malfunction Indicator Light/Check Engine Light (MIL) is properly illuminated. The I/M mechanic must be prompted to enter a "Fail" if the MIL does not properly illuminate.

7. Functional entries of the PCV, intake air heater, EFE and AIS must correspond with the visual inspection entries. For example, if the mechanic enters "N" for the AIS visual inspection, "N" shall be automatically entered for the AIS functional check, and the mechanic must not be allowed to modify the functional check entry unless the visual inspection entry is modified first.

8. For the functional EFE check, the analyzer must display the following prompt:

   DETERMINE THE TYPE OF EFE SYSTEM ON THE VEHICLE. ENTER PASS (P) OR FAIL (F) OR NOT APPLICABLE (N). FOR VEHICLES EQUIPPED WITH AN EFE GRID, PERFORM ONE OF THE FOLLOWING CHECKS AS DIRECTED BY THE LOCAL I/M PROGRAM OFFICE:

   A. MEASURE THE RESISTANCE ACROSS THE GRID TO GROUND TO DETERMINE IF IT MEETS MANUFACTURER'S SPECIFICATIONS. ENTER A PASS (P) IF IT MEETS, OR A FAIL (F) IF IT DOES NOT MEET SPECIFICATIONS.

   B. MEASURE FOR CONTINUITY THROUGH THE GRID TO GROUND. IF THERE IS CONTINUITY ENTER A PASS (P). ENTER A FAIL (F) FOR A GRID THAT DOES NOT SHOW CONTINUITY.

9. Error Messages:

   NO VALUE HAS BEEN ENTERED - TRY AGAIN.
   A VALID INSPECTION RESULTS CODE HAS NOT BEEN ENTERED - TRY AGAIN.
   YOU HAVE NOT COMPLETED THE EMISSION CONTROL SYSTEMS INSPECTION - PLEASE FINISH BEFORE ATTEMPTING TO PROCEED.

c. **Confirm Data Entry for Visual and Functional Inspection**

1. Display Prompt:

   REVIEW THE VISUAL AND FUNCTIONAL INSPECTION ENTRIES FOR ACCURACY. IF THIS INFORMATION IS CORRECT, PRESS <YES>. IF NOT, PRESS <NO> AND MAKE THE NECESSARY CORRECTIONS.

2. Programming Criteria:

   A. The EIS must display all previous entries and allow the mechanic to edit the information. The software must be designed to require the I/M mechanic to confirm that previous entries are correct before proceeding.

   B. Error Messages:

   Error messages must conform with the messages used for the manual data entry procedure.

d. Vehicle – EIS Hookup – for tailpipe tests

1. RPM Signal
An RPM pickup signal is only required on pre-1996 model year vehicles and those 1996 and newer model year vehicles that are exempted from the OBDII test (those vehicles indicated by 'F' in the Test Field of the OBD_Exemption Table).

However, an RPM signal may be required for those 1996 and newer model year vehicles that require an OBDII and tailpipe test. The EIS will check the OBDII Model Year Retest field, in the Region Table, for those OBDII model years that could require a tailpipe test if they continue to fail the OBDII test after a repair. It is expected that an RPM signal will be available to the analyzer using the OBDII port connector on most OBDII equipped vehicles but alternative options must be available for those OBDII vehicles requiring a tailpipe test.

A. Display Prompt:

> SELECT RPM PICK-UP DEVICE:
>   CONTACT
>   NON-CONTACT
>   OBDII PORT
>   OTHER.

B. Programming Criteria:

i. The software must prompt the I/M mechanic to select the RPM pickup type to be used when performing the emissions test.

ii. The EIS must provide additional prompts or submenus to guide the I/M mechanic for proper RPM pickup connection.

iii. The EIS must be equipped and programmed (as required by 40 CFR 85.2213-2200) to obtain the engine RPM measurements for all 1996 and newer passenger vehicles

and light-duty trucks via the OBD diagnostic link connector during the I/M inspection.

iv. The EIS must not prompt the mechanic for an OBDII connection as the RPM pickup device and must proceed to section **e.**, **OBD II Test Procedure,** if the test date is equal to or greater than the date in the OBDII Fail Start Date field in the REGION table and the vehicle model year is 1996 or newer and not exempt ('F' in Test field of OBD_Exemption Table). [Note, the EIS must prompt for an RPM pickup connection on 1996 and newer model year vehicles if a tailpipe test is required, please see section **e., OBDII Test Procedure 7. E. Failing OBDII After-Repair Test.**]

(01) The EIS must prompt the mechanic for an OBDII diagnostic link connection for all passenger vehicles and light-duty trucks that are 1996 and newer model years and whose make, model and model year is exempted in the OBD_Exemptions Table. The EIS must prompt the mechanic to detect engine RPM via the OBD port. The EIS must have a "help" option available to display the location of the OBD port using data in the VRT table. If selected, this information must be displayed graphically.

(02) The EIS must prompt the mechanic for an alternative RPM signal for OBDII vehicles whose make, model and model year is exempted in the OBD_Exemptions Table if the I/M mechanic enters the appropriate function key indicating a missing, damaged, tampered or inaccessible connector as described in section 3.3-1, e. 3 of this Part I (OBDII Hookup).

(03) The EIS must prompt for an alternative RPM signal for OBDII vehicles requiring a tailpipe test if no response is received from the on-board computer as described in section 3.3-1, e. 3 of this Part I (OBDII Hookup).

(04) The EIS must prompt for an alternative RPM signal device for OBDII vehicles requiring a tailpipe test if the RPM signal is unstable using the OBD port.

v. A screen must appear just prior to the emissions testing procedures, including preconditioning, which displays engine RPM and warns of the presence of an unstable signal. This screen must allow the I/M mechanic to locate a stable engine RPM signal. The I/M mechanic must be allowed to proceed by pressing a key when satisfied with RPM signal stability.

vi. RPM must be displayed during the emissions test. Instability must be immediately detected and displayed on the screen.

   (01) Display Prompt:
        UNSTABLE RPM SIGNAL -- CHECK OR CHANGE PICKUP LOCATION OR PICKUP DEVICE.

   (02) This procedure must loop back to the point of RPM pickup device selection.

C. For "OTHER" RPM pickup device, the EIS may have a unique engine RPM pickup device. If the EIS manufacturer provides this option, a written explanation/procedure regarding this option must be submitted to ADEC for approval.

e. **OBDII Test Procedure**

    1. Key-On/Engine-Off (KOEO) Check

        A. If "T" is in the Visual_Func_Test field of the REGION table for the test, the visual and functional test has been performed, skip to **OBDII Hookup** below.

        B. If "F" is in Visual_Func_Test field of the REGION table for the test, the visual and functional test has not been performed. The EIS must prompt the I/M mechanic to perform a key-on, engine-off check to determine if the MIL can properly illuminate, thus verifying that the OBDII system is capable of warning the driver of possible problems. The EIS must display the following prompt:

> KEY-ON/ENGINE-OFF (KOEO) TEST: TURN THE IGNITION KEY TO THE ON POSITION BUT DO NOT START THE ENGINE. ENTER PASS (P) IF THE MIL ILLUMINATES AND FAIL (F) IF THE MIL DOES NOT ILLUMINATE AT ALL. AFTER ENTERING THE PROPER RESULT, TURN OFF THE IGNITION KEY.

        C. The "P" or "F" that the mechanic entered must be written to the KOEO_Result field in the EIS table.

            i. If the mechanic enters a "P," the EIS must proceed to **KOER Check**.

            ii. If the mechanic enters an "F," the EIS must proceed to **OBDII Hookup** and a null value must be recorded in the the KOER_Result field in the EIS table.

    2. Key-On/Engine-Running (KOER) Check

        A. The EIS must prompt the I/M mechanic to perform a key-on, engine-running check to see if the MIL illuminates when the vehicle is operating. The EIS must display the following prompt:

> KEY-ON, ENGINE-RUNNING (KOER) TEST: START THE ENGINE AND ALLOW THE VEHICLE TO IDLE. ENTER PASS (P) IF THE MIL DOES NOT ILLUMINATE AND FAIL (F) IF THE MIL DOES ILLUMINATE. AFTER ENTERING THE PROPER RESULT, TURN OFF THE ENGINE.

        B. The "P" or "F" that the mechanic entered must be written to the EIS KOER field. The EIS must proceed to the **OBDII Hookup** section below.

        [Note: A Fail of either the KOEO or KOER check will not stop the OBDII test because all relevant data will be recorded on the test record.]

3. OBDII Hookup

A. The EIS must be equipped with a standard SAE J1978 OBD connector and communications link to allow an RPM signal, readiness codes, diagnostic trouble codes (DTCs), and Malfunction Indicator Light (MIL) status to be downloaded to the EIS from the on-board computer of applicable vehicles.

B. The EIS design and operation must meet all applicable Federal requirements (at 40 CFR 85.2207--.2231) and recommended SAE practices (J1962, J1978 and J 1979) for OBDII system I/M inspections.

C. The EIS must provide for use of a wireless OBDII interface connection. The wireless interface connection design and operation must meet all applicable Federal requirements (at 40 CFR 85.2207--.2231) and recommended SAE practices (J1962, J1978 and J 1979) for OBDII system I/M inspections.

D. Display Prompt:

DO YOU WISH TO USE A WIRELESS INTERFACE?

E. Programming Criteria:

i. If there is a "T" in the Wireless Prompt field of the REGION Table, as provided by the VID, the EIS display prompt above will be activated; if "F" in the field the EIS display prompt must not be activated.

ii. If the mechanic enters a "yes" to the above display prompt, the EIS will prompt for an OBDII diagnostic link connection using a wireless interface, and must proceed to describe the instructions for connection for the mechanic.

iii. If the mechanic enters a "no" to the above display prompt, the EIS must proceed with the standard OBDII connector hookup procedures.

iv. This display prompt must not be displayed if the vehicle must have a tailpipe test rather than an OBDII test.

F. The OBDII interrogation process, using either the wireless interface or the standard connector, must be fully integrated into the Alaska2000 EIS. The interrogation process must generate a composite readiness test status for each readiness monitor based on the responses of ALL the responding on-board modules. The EIS must attempt to access all vehicle on-board modules. The interrogation process must be automated and require no mechanic intervention to collect and record OBDII data retrieved via the OBDII diagnostic link. OBDII readiness codes, DTCs, and MIL status, must be automatically retrieved through a standard interface or the wireless interface and vehicle connector.

G. Display Prompt:

>   LOCATE THE VEHICLE'S OBDII DIAGNOSTIC LINK CONNECTOR.
>   ATTACH THE EIS OBDII PORT TO THE VEHICLE CONNECTOR.

H. Programming Criteria:

i.   The EIS must prompt for an OBDII diagnostic link connection for all passenger vehicles and light-duty trucks that are the same model year as, or newer than, the vehicle model year identified in the REGION table OBDII Model Year field and whose make, model and model year has not been exempted in the OBD_Exemptions table.

ii.   The EIS must not display the above prompt if a wireless interface is used because the wireless interface should already have been connected. (See **3. OBDII Hookup**, **E.ii.** above**)**

iii. The EIS must be designed to provide assistance to the I/M mechanic with OBDII connector locations using an OBDII connector look-up table as part of the VRT table.

(01) The OBDII connector location fields on the VRT must be updateable by the EIS through the VID.

(02) The OBD connector location fields must be blank upon VRT delivery. ADEC must have the option to fill in the OBD location information, as the data on particular vehicles becomes available.

(03) The EIS must offer the OBDII connector location graphic as a "help" option to the I/M mechanic. A graphic must be displayed that shows the approximate location of the OBD connector based on the VRT "matrix" location value (1-9). Along with the VRT comment, the EIS must also indicate whether the OBD connector has a cover.

I. Error Messages:

>   THE OBDII CONNECTION CANNOT BE CONFIRMED - PLEASE TRY
>   AGAIN.
>   PRESS <CONNECT> TO CONTINUE.
>
>   IF THE OBDII CONNECTOR IS MISSING, DAMAGED, TAMPERED OR
>   CANNOT BE LOCATED PRESS <MISSING, TAMPERED OR
>   UNAVAILABLE> TO CONTINUE.

J. Programming Criteria:

i.   The EIS must allow the I/M mechanic unlimited attempts to gain a confirmed OBDII connection.

    ii.   The EIS must allow the I/M mechanic to switch back to a standard connection after the option to use a wireless interface has been selected should the wireless option have been identified in error or the wireless option is inoperable.

    iii.   If the I/M mechanic enters the appropriate function key indicating a missing, damaged, tampered or inaccessible connector:

        (01) A "C" must be written to the OBDII Test Result Field in EIS;

        (02) If the test date is less than the date in the OBDII Fail Start Date field in the REGION table, the EIS must return to the **Vehicle –EIS Hookup** procedure and prompt the mechanic for an alternate RPM pick-up device; or

        (03) If the test date is greater than or equal to the date in the OBDII Fail Start Date field in the REGION table, the EIS must proceed to **Overall OBDII Result**.

4. OBDII Readiness Evaluation

   A. Programming Criteria:

    i.   A Mode $01, PID $01 request (in accordance with SAE J1979) must be transmitted to all on-board modules to determine the evaluation status of the OBD system, the number of emission-related diagnostic trouble codes stored in memory, and the MIL status.

    ii.   Only after an RPM signal is detected will the analyzer make the Mode $01, PID $01 request. If an RPM signal is not detected, a screen prompting the mechanic to start the vehicle will be displayed.

    iii.   If no response to the Mode $01, PID $01 request is received from all applicable on-board modules, the EIS must send no more than 2 additional Mode $01 PID $01 requests before displaying a screen prompt asking the mechanic for a retry. The mechanic must be able to enter "retry" as many times as necessary. For each time the mechanic enters "retry," the EIS must send only one Mode$1 PID $01 request. If the mechanic enters "No" for the retry question:

        (01) An "N" must be written to the OBDII Test Result Field in EIS;

        (02) If the test date is less than the date in the OBDII Fail Start Date field in the REGION table, the EIS must return to the **Vehicle – EIS Hookup** procedure and prompt the mechanic for an alternate RPM pick-up device; or

(03) If the test date is greater than or equal to the date in the OBDII Fail Start Date field in the REGION table, the EIS must proceed to **Overall OBDII Result**.

iv. Based on the returned data, the EIS must determine which on-board readiness monitors are supported by the OBD system and the readiness monitor status of each applicable monitors.

v. Possible readiness monitors include the following:

    (01) Misfire (continuous),
    (02) Fuel system (continuous),
    (03) Comprehensive component (continuous),
    (04) Catalyst (once/trip),
    (05) Heated catalyst (once/trip),
    (06) Evaporative system (once/trip),
    (07) Secondary air system (once/trip),
    (08) Air conditioning system (once/trip),
    (09) Oxygen sensor (once/trip),
    (10) Oxygen sensor heater (once/trip), and
    (11) EGR system (once/trip).

vi. Continuous monitors are those in which the applicable system/condition is checked continuously during vehicle operation; once/trip monitors are only checked when the vehicle is driven in a certain manner (i.e., over a predefined driving cycle expected to occur in customer service). Pursuant to 40 CFR 86.099-17, a vehicle manufacturer is not required to store a readiness code for continuous operating monitors; however, some may choose to do so.

vii. Possible readiness monitor responses include: completed, not completed, and not supported/enabled. A response that a monitor is not supported or enabled means that, for this particular vehicle, that monitor is not applicable. Hence, when a 'not supported/enabled' response is given, the EIS must not use that monitor for readiness determination purposes.

viii. All readiness monitor values must be written to the appropriate test record fields in the EIS table for each inspection using the following format where a "T" from the REGION table, or the OBD_Exemptions Table indicates VID-enabled; and an "F" from the REGION table, or the OBD_Exemption table indicates VID-disabled:

    (01) 0=VID-enabled; not supported/enabled
    (02) 1=VID-enabled; completed
    (03) 2=VID-enabled; not completed
    (04) 3=VID-disabled; not supported/enabled

(05) 4=VID-disabled; completed

(06) 5=VID-disabled; not completed

ix. If the value specified in the REGION table for a particular readiness monitor is "T," that readiness code must be used for the overall readiness determination, unless an "F" value is specified in the OBD_Exemptions table. The readiness monitor value in the OBD_Exemption table must have precedence over those values specified in the REGION table. If the value specified for a readiness monitor in the REGION table is "F," that readiness code must be ignored by the EIS and not used for the overall readiness determination, unless a "T" value is specified in the OBD_Exemptions table. The readiness monitor values in the OBD_Exemtion table must always have precedence over those values specified in the REGION table.

[Note: The REGION table may disable or enable readiness codes universally regardless of make, model or model year of the vehicle. The OBD_Exemptions table disables or enables readiness codes for specific make, model and model year vehicles. To allow flexibility to determine the best testing method, one table must have precedence over the other for specific vehicles. For example, the evaporative monitor may be problematic for the majority of the vehicles in Alaska. Therefore, for illustrative purposes, the evaporative monitor is disabled in the REGION table. However, if a specific make, model, model year vehicle needs to have the evaporative monitor's readiness status complete, the logic above is intended to allow for the specific vehicle's need to have precedence over the universal setting.]

x. All readiness monitor values must be written to the appropriate test record fields in the EIS table using the above format at the time the EIS interrogates the on-board module(s).

5. Malfunction Indicator Light (MIL) status and Diagnostic Trouble Code (DTC) Check

A. Programming Criteria:

i. The EIS must evaluate the MIL status based on the data returned via the OBD diagnostic link connector from the vehicle on-board diagnostic system. The On/Off (0/1) status indicating whether the MIL has been commanded to

be illuminated must be recorded in the OBD_MIL_STATUS field of the EIS table.

ii. If the MIL has been commanded to be illuminated, the EIS must send a Mode $03 request to the on-board module(s) to determine the stored emissions-related powertrain diagnostic trouble codes (DTCs). The EIS must repeat this cycle until the number of DTCs reported equals the number

expected based on the previous Mode $01 response.

   iii.   The total number of stored DTCs, that are also listed in the DTC table, (not including pending DTCs) must be written to the EIS DTCs Stored field and all DTCs resulting in the MIL illumination, that are also listed in the DTC table, must be written to the EIS OBD Flt Codes field at the time the EIS interrogates the on-board module(s). If there is not sufficient space in the EIS OBD Flt Codes field to record all DTCs, as many as possible must be recorded. The presence of more DTCs than can be recorded must not cause the software to hang.

   iv.   All recorded DTCs resulting in the MIL illumination, that are also listed in the DTC table, and the total number of stored DTCs, that are also listed in the DTC table, must be printed on the VIR. The recorded DTCs resulting in the MIL illumination must be printed on the VIR, regardless of readiness status.

   v.   The EIS must then proceed to **Additional OBDII Data Download**.

6. Additional OBDII Data Download

   A. Programming Criteria:

      i.   PID Count, PCM Module ID and if available VIN shall be obtained via the OBD link and written to the OBD_PID, OBD_PCM ID and OBD_VIN fields, respectively, in the test record.

      ii.   Proceed to **OBDII Test Determination**.

7. OBDII Test Determination
In addition to the mechanic's entry, the VID must also compare the type of test currently being conducted with previous tests conducted on the vehicle to determine if the EIS should treat the current test type differently. ADEC must have the ability to change the allowable number of unset readiness monitors for a passing after repair test should substantiating OBDII repairs, for example, becomes problematic.

   A. VID-determined test type:

      i.   On initial contact with the VID, the VID-determined test type must be transmitted to the EIS. The VID-determined test type must be recorded to the test record in the appropriate field (not in the test type field recorded from the mechanic's input). There must be four categories for VID-determined test types:

          (01) I = VID-determined Initial test,
          (02) R = VID-determined Retest,
          (03) A = VID-determined After Repair Test, and

(04) N = VID-determined Not Complete Test.

ii.   For off-line tests, the VID-determined test type must default to the test type selected by the mechanic.

B. Initial Readiness Determination for a VID-determined Initial test (I), a Retest (R), an After-repair test (A) or a Not Complete test (N):

The EIS must check the REGION table for the following fields: MY_Ready field, Ready Unset 1 field, Ready Unset2 field, Ready After Repair 1 field, and the Ready After Repair 2 field.

Note: Federal law allows one set of unset readiness monitors to pass for model year 1996 – 2000 vehicles and a different set of unset readiness monitors to pass for model year 2001 and newer vehicles. To maintain maximum flexibility, the MY_Ready field establishes the break in model years at which the difference in allowable unset readiness codes begins. The four Ready fields must allow the flexibility to change the allowable number of monitors to be unset, above and below the established model year break point, and still pass the OBD test.

i.   For a VID-determined Initial test (I) and Retest (R),

(01) For those vehicles whose model year is less than or equal to the Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Codes Status = 2) is less than or equal to the number in the Ready Unset 1 field of the REGION table, or

(02) For those vehicles whose model year is greater than the Model Year in the MY_Ready field whose number of unset readiness codes (Readiness Codes Status = 2) is less than or equal to the number in the Ready Unset 2 field of the REGION table,

(a) The vehicle passes the Initial Readiness Determination,

(b) A "P" must be written to the OBD Readiness Result field in the EIS, and

(c) The EIS must proceed to the MIL status and Diagnostic Trouble Code (DTC) Determination for an VID-determined Initial test (I), Retest (R), After-repair test (A) or Not Complete test (N).

(03) For those vehicles whose model year is less than or equal to the Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Codes Status = 2) is greater than the number in the Ready Unset 1 field of the REGION table, or

(04) For those vehicles whose model year is greater than the Model Year in

the MY_ Ready field whose number of unset readiness codes (Readiness Codes Status = 2) is greater than the number in the Ready Unset 2 field of the REGION table,

   (a) The vehicle fails the Initial Readiness Determination, and

   (b) The EIS must proceed to the MIL status and DTC Determination for an EIS-determined Initial test (I), Retest (R), After-repair test (A) or Not Complete test (N).

  ii.   For the VID-determined After-repair test (A) or Not Complete test (N),

    (01) For those vehicles whose model year is less than or equal to the Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Codes Status = 2) is less than or equal to the number in the Ready After Repair 1 field of the REGION table, or

    (02) For those vehicles whose model year is greater than the Model Year in the MY_Ready field whose number of unset readiness codes (Readiness Codes Status = 2) is less than or equal to the number in the Ready After Repair 2 field of the REGION table,

      (a) The vehicle passes the Initial Readiness Determination,

      (b) A "P" must be written to the OBD Readiness Result field in the EIS, and

      (c) The EIS must proceed to MIL status and DTC Determination for an EIS-determined Initial test (I), Retest (R), After-repair test (A) or Not Complete test (N).

    (03) For those vehicles whose model year is less than or equal to Model Year in the MY Ready field and whose number of unset readiness codes (Readiness Codes Status = 2) is greater than the number in the Ready After Repair 1 field of the REGION table, or

    (04) For those vehicles whose model year is greater than the Model Year in the MY_Ready field whose number of unset readiness codes (Readiness Codes Status = 2) is greater than the number in the Ready After Repair 2 field of the REGION table,

      (a) The vehicle fails the Initial Readiness Determination and

      (b) The EIS must proceed to the MIL status and DTC Determination for an EIS determined Initial test (I), Retest (R), After-repair test (A) or Not Complete test (N).

C. MIL status and DTC Determination for a VID-determined Initial test (I), Retest (R), After-repair test (A) or Not Complete test (N):

i.   If the MIL has NOT been commanded to be illuminated (OBD MIL Status =
     1) and the vehicle passed the Initial Readiness Determination, the EIS must
     proceed to **Overall OBDII Result**.

ii. If the MIL has NOT been commanded to be illuminated (OBD MIL Status =
     1) and the vehicle failed the Initial Readiness Determination, the EIS must
     proceed to Secondary Readiness Determination.

iii. If the MIL has been commanded to be illuminated (OBD MIL Status = 0),
     and there are one or more DTCs found (a DTC must be in the DTC table in
     order for the test to be considered a failure), for a VID-determined Initial test
     (I) or Retest (R), the EIS must proceed to **Overall OBDII Result**. If the
     vehicle failed the Initial Readiness Determination, an "F" must be written to
     the OBD Readiness Result field.

iv. If the MIL has been commanded to be illuminated (OBD MIL Status = 0),
     and there are one or more DTCs found (a DTC must be in the DTC table in
     order for the test to be considered a failure), for a VID determined After-
     repair test (A) or Not Complete test (N) and the vehicle failed the Initial
     Readiness Determination:

     (01) an "F" must be written to the OBD Readiness Result field, and

     (02) the EIS must proceed to Failing OBDII After-Repair Test.

v.   If the MIL has been commanded to be illuminated (OBD MIL Status = 0),
     and there are one or more DTCs found (a DTC must be in the DTC table in
     order for the test to be considered a failure), for an EIS determined After-
     repair test (A) or Not Complete test (N), and the vehicle passed the Initial
     Readiness Determination, the EIS must proceed to Failing OBDII After-
     Repair Test.

D. Secondary Readiness Determination:

i.   VID-Determined Initial Test, "I" in the VID_Test Type field for current test:
     for those vehicles whose model year is less than or equal to Model Year in
     the MY_Ready field and whose number of unset readiness codes (Readiness
     Code Status = 2) is greater than the number in the Ready Unset 1 field of the
     REGION table, or for those vehicles whose model year is greater than the
     Model Year in the MY Ready field and whose number of unset readiness
     codes (Readiness Code Status = 2) is greater than the number in the Ready
     Unset 2 field of the REGION table,

     (01) an "A" (abort) must be written to the OBDII Readiness Result field in

EIS, and

(02) the abort code value must be "40." This abort value shall be automatically written to the EIS table by the EIS. The mechanic shall not select the abort code.

(03) The EIS must proceed to **Overall OBDII Result.**

ii. VID-Determined Retest, "R" in the VID_Test Type field for current test: For those vehicles whose model year is less than or equal to Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready Unset 1 field of the REGION table, or for those vehicles whose model year is greater than the Model Year in the MY_ Ready field whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready Unset 2 field of the REGION table,

(01) an "F" must be written to the OBDII Readiness Result field, and

(02) the EIS must proceed to **Overall OBDII Result**.

iii. VID-Determined After-Repair Test, "A" in the VID_Test Type field for current test: for those vehicles whose model year is less than or equal to Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready After Repair 1 field of the REGION table, or for those vehicles whose model year is greater than the Model Year in the MY Ready field whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready After Repair 2 field of the REGION table;

(01) an "F" must be written to the OBDII Readiness Result, and

(02) the EIS must proceed to **Overall OBDII Result**.

iv. VID-Determined Not Complete Test, "N" in the VID_Test Type field for a current test: For those vehicles whose model year is less than or equal to Model Year in the MY_Ready field and whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready After Repair 1 field of the REGION table, or for those vehicles whose model year is greater than the Model Year in the MY Ready field whose number of unset readiness codes (Readiness Code Status = 2) is greater than the number in the Ready After Repair 2 field of the REGION table;

(01) an "F" must be written to the OBDII Readiness Result and

(02) the EIS must proceed to **Overall OBDII Result**.

E. Failing OBDII After-Repair Test:
The EIS must check the OBDII Model Year Retest field in the REGION table.

i.   If the model year of the vehicle is newer than the model year specified in the OBDII Model Year Retest field,

(01) the EIS must check the EIS OBDII Failure Date field.

(a) If the test date is less than the date in the OBDII Failure Date field;

(1) an "F" must be written to the OBDII Test Result field in the EIS, and

(2) the EIS must proceed to **Overall OBDII Result**.

(b) If the test date is equal to or greater than the date in the OBDII Failure Date field;

(1) an "F" must be written to the OBDII Test Result and the Overall Test Result fields in the EIS table, and

(2) the EIS must proceed to **Overall OBDII Result**.

ii. If the model year of the vehicle is equal to or older than the model year specified in the OBDII Model Year Retest field in the REGION table,

(1) The EIS must not check the EIS OBDII Failure Date field as the Model Year Retest Field has precedence.

(2) An "F" must be written to the OBDII Test Result field in the EIS,

(3) the mechanic must perform a tailpipe test, and

(4) the EIS must proceed to **Overall OBDII Result**.

F. Overall OBDII Result
Based on the test results and the VID-determined test type, the EIS must take the action in the sequence indicated in the following table.

i.   Test values must be written to the OBDII Test Result and Overall Test Result fields in EIS,

ii. test information must be printed on the VIR, and

iii.   those vehicles that receive a follow-up tailpipe emissions inspection, as shown in the following table, must:

(01)   be prompted for a steady RPM signal (using the procedures identified in section **d. Vehicle –EIS Hookup – for tailpipe tests, 1. RPM Hook Up**), and

(02)   the EIS must perform the tailpipe portion of the test under section **3.3-1, V of this Part I (Emission Test. (Tailpipe))**.

iv.   If the overall individual results (check all OBDII fields including individual readiness monitors) of the current test matches the conditions from the flagged pretest alert, an R will be written in the OBDII Test Result and Overall Result Fields. Referee Referral will be printed in the OBDII result and Overall Result portions of the VIR. The VIR message will be printed from the flagged pretest alert.

Note: Each section of the OBDII test has a result field: KOEO, KOER, Readiness, and MIL Status. There are also OBDII Test Result and Overall Test Result fields. The OBDII Test Result field is a summary of the KOEO, KOER, Readiness, and MIL Status fields. Whenever there is a "Fail" or "F" in the KOEO, KOER, and Readiness, or if the MIL Status field is "0" (MIL commanded ON) with DTCs (from the DTC table) present, then the OBDII Test Result field will also be a "Fail/F." The Overall Test Result field will have a Pass/Fail determination dependent upon a number of different scenarios mostly dealing with specific dates or vehicle model years, which may trigger a required tailpipe test. Each row in the following table identifies those incidences when a tailpipe test is required for OBDII vehicles (not previously exempted) and the appropriate VIR message. In other words, each row of the table contains specific testing logic. Please review each scenario carefully. Also be aware, that some of the fields below replicate information previously given in the logic of the various OBD test sections above.

Test Outcome	Model Year Retest[1]	OBDII Ready Result[2]	OBDII Test Result[3]	Tailpipe Emissions Inspection[4]	Overall Test Result[5]	OBD VIR Result[6]	Overall VIR Result[5,6]	Other VIR Contents[6]	VIR Message[7]
Test Date = Less Than Date in OBDII Failure Date Field in REGION Table									
KOEO = F	n/a	n/a	F	Yes	F	Fail	Fail	n/a	1
KOEO = P	n/a	n/a	P	Yes	--	Pass	--	n/a	n/a
KOER = F	n/a	n/a	F	Yes	F	Fail	Fail	n/a	2
KOER = P	n/a	n/a	P	Yes	--	Pass	--	n/a	n/a
OBDII Result = C	n/a	n/a	C	Yes	--	Fail	--	n/a	3

Test Outcome	Model Year Retest[1]	OBDII Ready Result[2]	OBDII Test Result[3]	Tailpipe Emissions Inspection[4]	Overall Test Result[5]	OBD VIR Result[6]	Overall VIR Result[5,6]	Other VIR Contents[6]	VIR Message[7]
OBDII Result = N	n/a	n/a	N	Yes	--	Fail	--	n/a	4
MIL Commanded On w/o DTC present	n/a	n/a	P	Yes	--	Pass	--	n/a	15, n/a
MIL Commanded On with DTC (from DTC table present)	n/a	n/a	F	Yes	--	Fail	--	DTCs	5
Not Ready EIS-Determined Initial Test	n/a	A	A	Yes	--	Abort	--	Unset ready codes	6
Not Ready EIS-Determined Retest	n/a	F	F	Yes	--	Fail	--	Unset ready codes	6
Not Ready EIS-Determined After-repair Test	n/a	F	I	Yes	--	Incomplete	--	Unset ready codes	6
Not Ready EIS-Determined Not Complete Test	n/a	F	R	Yes	--	Referee Referral	--	Unset ready codes	7
OBDII Result = P	n/a	n/a	P	Yes	--	Pass	--	n/a	n/a
Test Date = Equal to or Greater Than Date in OBDII Fail Start Date Field in REGION Table									
KOEO = F	n/a	n/a	F	No	F	Fail	Fail	n/a	1
KOEO = P	n/a	n/a	P	No	P	Pass	Pass	n/a	n/a
KOER = F	Yes	n/a	F	No	F	Fail	Fail	n/a	2
KOER = F	No	n/a	F	Yes (after-repair test only)	--	Fail	--	n/a	8
KOER = P	n/a	n/a	P	No	P	Pass	Pass	n/a	n/a

Test Outcome	Model Year Retest[1]	OBDII Ready Result[2]	OBDII Test Result[3]	Tailpipe Emissions Inspection[4]	Overall Test Result[5]	OBD VIR Result[6]	Overall VIR Result[5,6]	Other VIR Contents[6]	VIR Message[7]
OBDII Result = C	n/a	n/a	C	No	F	Fail	Fail	n/a	9
OBDII Result = N	n/a	n/a	N	No	F	Fail	Fail	n/a	10
MIL Commanded On w/o DTC present	n/a	n/a	P	No	P	Pass	Pass	n/a	15, 14
MIL Commanded On with DTC (from DTC table present)	Yes	n/a	F	No	F	Fail	Fail	DTCs	11
MIL Commanded On with DTC (from DTC table present)	No	n/a	F	Yes (after-repair test only)	--	Fail	--	DTCs	8, 11
Not Ready VID-Determined Initial Test	n/a	A	A	No	A	Abort	Abort	Unset ready codes	12
Not Ready VID-Determined Retest	n/a	F	F	No	F	Fail	Fail	Unset ready codes	12
Not Ready VID-Determined After-repair Test	n/a	F	I	No	I	Incomplete	Incomplete	Unset ready codes	12
Not Ready VID-Determined Not Complete Test	n/a	F	R	No	R	Referee Referral	Referee Referral	Unset ready codes	13
OBDII Result = P			P	No	P	Pass	Pass	n/a	14

[1] Yes = vehicle model year newer than model year value specified in OBDII Model Year Retest field in the REGION table. No = vehicle model year equal to or older than specified model year.

[2] P = vehicle ready for OBDII test, F = Fail due to not ready status, and A = Abort

due to not ready status.

[3] Column shows value written in OBDII Test Result field in EIS.

[4] Yes = a tailpipe emissions inspection is to be conducted on the vehicle if the model year of the vehicle is equal or older than the model year specified in the OBDII Model Year Retest field in the REGION table. After proper test results are written to the applicable fields in the EIS table, the EIS must proceed to **Emissions Inspection (Tailpipe)**, the tailpipe portion of the test. Note that if the model year of the vehicle is equal to or older than the model year specified in the OBD Model Year Retest field in the REGION table, a passing tailpipe test result will override an OBDII failure (e.g., due to the MIL being commanded on or an illuminated MIL) on an after-repair test.

[5] "--" = overall results are to be based on tailpipe inspection results.

[6] Information to be printed on the VIR in addition to the messages to be printed as identified in the VIR message column.

[7] Each VIR message is specifically numbered, column shows appropriate VIR message to be printed for each case or specific instructions to be followed.

A. VIR Messages
Appendix D shows examples of various VIRs. The type of VIR printed depends on whether or not the visual/ functional or tailpipe tests are conducted.

i.   For those tests that are not referee tests, where there is an 'F' in the Visual_Func _Test field of the REGION table, the format shown in Appendix D 11 or D 12 must be used. However, the current test type, identified by the mechanic determines which of the two possible formats are to be used.

ii.   The appropriate message must be printed whenever the above table indicates a VIR message. The number shown in the column labeled "VIR Message" indicates which of the following VIR messages are to be printed or specific instructions to be followed. Print all messages that are applicable for the VID-determined test type. The following summary descriptions must be expanded as needed to properly convey the information in an easily understandable manner to motorists.

1. "MIL did not properly illuminate when tested." New line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

2. "On-board diagnostic system is showing an emissions-related defect present on the vehicle." New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

3. "Vehicle on-board diagnostic system could not be checked due to a missing, damaged, tampered, or inaccessible connector. OBD failure is advisory only." New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

4. "Vehicle on-board diagnostic system did not respond to the request for data. OBD failure is advisory only." New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

5. "Your vehicle's computerized self-diagnostic system (OBD) registered the fault(s) listed below. This fault(s) is probably an indication of a malfunction of an emission component. However, multiple and/or seemingly unrelated faults may be an indication of an emission-related problem that occurred previously but upon further evaluation by the OBD system was determined to be a temporary condition. Therefore, proper diagnosis by a qualified technician is required to positively identify the source of the problem." New line: List DTCs with an appropriate label for each listed DTC. Also print total number of DTCs recorded by system. New line: "OBD failure is advisory only. If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

6. "Vehicle on-board diagnostic system was not ready for testing due to the following unset readiness monitors." New line: List applicable unset readiness codes with an appropriate label for each code. Only list those unset codes that are VID-enabled for the vehicle. New Line: "OBD result is advisory only."

7. "Vehicle on-board diagnostic system was not ready for testing due to the following unset readiness monitors." New Line: List applicable unset readiness codes with an appropriate label for each code. Only list those unset codes that are VID-enabled for the vehicle. New Line: "OBD result is advisory only If you are having difficulties getting the vehicle ready for testing, please schedule an appointment with the Referee Facility for assistance in getting readiness monitors set."

8. On-board diagnostic system is showing an emissions-related defect present on the vehicle. If the vehicle subsequently passes the tailpipe emissions inspection, the following message must also be printed:

    THE ON-BOARD DIAGNOSTIC SYSTEM INDICATES A PROBLEM.

VEHICLE EMISSIONS ARE STILL WITHIN ACCEPTABLE RANGES, BUT TO ENSURE THE VEHICLE CONTINUES TO OPERATE EFFICIENTLY, IT IS RECOMMENDED THAT ANY DEFECTS BE REPAIRED AS SOON AS POSSIBLE.

9. "Vehicle on-board diagnostic system could not be checked due to a missing, damaged, tampered, or inaccessible connector." New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

10. "Vehicle on-board diagnostic system did not respond to the request for data." New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

11. "Your vehicle's computerized self-diagnostic system (OBD) registered the fault(s) listed below. This fault(s) is probably an indication of a malfunction of an emission component. However, multiple and/or seemingly unrelated faults may be an indication of an emission-related problem that occurred previously but upon further evaluation by the OBD system was determined to be a temporary problem. Therefore, proper diagnosis by a qualified technician is required to positively identify the source of the problem." New Line: List DTCs with an appropriate label for each listed DTC. Also print total number of DTCs recorded by system. New Line: "If your vehicle is still under warranty, please contact the Authorized Dealer for repair; if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution."

12. "Vehicle on-board diagnostic system was not ready for testing due to the following unset readiness monitors." New Line: List applicable unset readiness codes with an appropriate label for each code. Only list those unset codes that are VID-enabled for the vehicle.

13. "Vehicle on-board diagnostic system was not ready for testing due to the following unset readiness monitors." New Line: List applicable unset readiness codes with an appropriate label for each code. Only list those unset codes that are VID-enabled for the vehicle. New Line: "OBD result is advisory only. If you are having difficulties getting the vehicle ready for testing, please schedule an appointment with the Referee Facility for assistance in getting readiness monitors set."

14. "Congratulations! Your vehicle passed the inspection." New Line: "The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue." New Line: Certificate of Inspection #: XXXXXXXX." [Note: Bold message, center across page as shown in other passing VIR examples in Appendix D.]

15. If the EIS finds a "T" in the Visual_Func_Test field of the REGION table and the MIL is commanded on, but no DTCs present, the VIR should not indicate an 'F' in the Malfunction Indicator Lamp result but be left blank.

V. EMISSIONS INSPECTION (Tailpipe)

This section (3.3-1, V) describes the emissions inspection procedure. The manufacturer must develop the displays necessary to guide the I/M mechanic through the required steps of the emissions inspection.

a. General Requirements

1. During the exhaust sampling sequence of the emissions inspection, the word TESTING must be displayed.

2. The analyzer must not display the emissions readings during the emissions testing procedure.

3. The display, when in the exhaust sampling sequences of the emissions inspection, must be readable at a distance of eight feet in a building which meets OSHA lighting standards for a garage environment. Contrast must be adjustable.

4. The test sequence must include at least the following parameters: HC, CO, CO_2, O_2 and engine RPM.

5. The I/M mechanic must deploy a non-intrusive RPM Sensor or OBDII port connection and insert the sample probe into the tailpipe before the test sequence begins.

6. The test timer governing the overall test sequence must start when sampling begins.

7. A separate mode timer must govern the modes within the test sequence and must start when the specified conditions are met.

8. The anti-dilution criterion must be a minimum combined CO and CO_2 concentration of six percent for all vehicles unless there is an alternate emission control system specific value contained in the ESC table.

9. Exhaust gas-sampling algorithm. The analysis of exhaust gas concentrations begins ten seconds after the applicable test mode begins. Exhaust gas concentrations must

be analyzed at a rate of once every 0.5 seconds. The measured value for pass/fail determinations is a simple running average of the measurements taken over five seconds.

10. Pass/fail determination. A pass or fail determination is made for each applicable test mode based on a comparison of the test standards contained in Section 3 and 4. A vehicle must passes the test mode if simultaneous values for HC and CO are below or equal to the applicable test standards.

11. Multiple exhaust pipes. Exhaust gas concentrations from vehicle engines equipped with multiple exhaust pipes must be sampled simultaneously.

12. The test must be immediately terminated upon reaching the overall maximum test time.

13. The EIS software must apply a dilution correction factor (DCF) to HC and CO values in the inspection results.

14. A low flow condition must cause the testing period to restart for that mode. A "LOW FLOW ERROR" message must be displayed on the screen if this occurs.

b. Sample System Readiness

1. The analyzer must be zeroed in accordance with the manufacturer's recommended procedures using zero air. The maximum HC hang-up (the residual HC in the sampling system) limit value is a variable set from the REGION table but the default value applied must be 15 ppm.

2. The HC hang-up check must be done immediately after the analyzer is zeroed and the ambient air is sampled. The zeroing must be initiated after an emissions test has been initiated and the initial VID contact sequence has been successfully or unsuccessfully completed. The whole ambient air-HC hang-up sequence must run in background while the I/M mechanic is entering vehicle information.

3. Display Prompt:

    A. If the ambient air or hang-up check is not completed before the I/M mechanic is ready to start the tailpipe test, the EIS must display the following message: HC HANGUP CHECK IN PROGRESS.

    B. If the hang-up check is not successfully completed in 150 seconds from the start of the hang-up check, the EIS must display the following message: POSSIBLE DIRTY PROBE, HOSE OR FILTER.

4. The software must not allow the inspection to continue until after the system passes the HC hang-up check.

5. Programming Criteria:
The final sample values used during HC hang-up to make the final hang-up check decision, from both the bench port and the probe, must be recorded in the test record in HC ppm.

c. Dilution Correction Factor (DCF)

1. The minimum dilution limit (example: $CO+CO_2$ is $>= 6\%$) is a variable set from the ESC table file.

2. The EIS software must apply a DCF to the HC and CO inspection emissions results whenever the $CO+CO_2$ is $>= 6\%$ to account for any exhaust sample dilution, intentional or unintentional, occurring during inspection. The EIS must calculate the DCF using the following procedure, and must pre-select the formula appropriate to the vehicle's fuel type. If the calculated DCF exceeds 3.0, a default value of 3.0 must be used. If the DCF falls below 1.0, then a default value of 1.0 must be used.

3. The EIS software must Calculate "X" using the EIS measurements of CO and CO_2.

A. $X = \dfrac{[CO_2]_{measured}}{[CO_2]_{measured} + [CO]_{measured}}$.

B. Where $[CO_2]_{measured}$ and $[CO]_{measured}$ are the final readings.

4. The EIS software must Calculate the DCF using the following formula:

$$DCF = \dfrac{[CO_2]_{adjusted}}{[CO_2]_{measured}}.$$

5. The EIS software must calculate $[CO_2]_{adjusted}$ using the following formulas:

A. For Gasoline:

$[CO_2]_{adjusted} \text{ (gasoline)} = [x/(4.644 + 1.88x)]100$.

B. For Liquefied Petroleum Gases (LPG):

$[CO_2]_{adjusted} \text{ (LPG)} = [x/(5.39 + 1.88x)]100$.

C. For Compressed Natural Gas (CNG):

$[CO_2]_{adjusted} \text{ (CNG)} = [x/(6.64 + 1.88x)]100$.

    D. Corrected HC = measured HC (DCF).
        Corrected CO = measured CO (DCF).
        Corrected CO_2 = measured CO_2 (DCF).

6. When "B" (bi-fueled) is selected as the fuel type the analyzer must use the dilution correction factor formula for Compressed Natural Gas (CNG) when performing a CNG mode test.

7. The appropriate equations must be applied by the EIS to compute the DCF based on the fuel type input to the EIS by the I/M mechanic. The EIS must apply the DCF to the final emission readings of the inspection to calculate the dilution-adjusted values. The EIS must then compare the dilution-adjusted values against the vehicle's emission standards to determine the pass/fail status of the vehicle. The dilution-adjusted values must be the final emission readings for the test vehicle. They must be printed on the VIR and must be stored in the test record. The values recorded must be the calculated DCF values, not the default values.

d. Two-speed Idle Tailpipe Test Procedure

1. General Requirements

    A. Two-speed idle testing must be administered on all vehicles.

    B. The two-speed idle test must consist of a test of the vehicle's exhaust emissions at idle and at 2500 rpm while the vehicle's gear selector is in neutral or park. The 2500 rpm test must be administered prior to the idle test. The test time for each mode must be 30 seconds. The tests must be run consecutively.

    C. The complete test must consist of a first chance, first mode test; followed by a first chance, second mode test. If the vehicle fails either of the first chance test modes, the vehicle may be "post conditioned" for the appropriate time at 2500 RPM and may receive a second chance test (for both modes). However, if the vehicle fails the first chance test (i.e., either the idle or 2500 RPM test or both), the preconditioning and second chance test must be omitted if, for both test modes, no exhaust hydrocarbon concentration less than 1800 ppm is detected for the duration of either test mode.

    D. Vehicles that fail the visual or functional inspection due to missing, modified, defective, or disconnected emission control systems must not be preconditioned or retested.

    E. Special test instructions (Test Sequences #2 and greater) may apply to specific vehicle models and must be followed in lieu of the normal test procedures (Test Sequence #1).

F. Display Features

  i.   Display during emissions inspection. During the exhaust sampling sequence of the emissions inspection, the word TESTING must be displayed.

  ii. Messages permitted during the emissions inspection. The analyzer must display messages indicating if either excessive exhaust dilution or out of range engine speed conditions occur during the emissions inspection test. Restart capabilities are allowed, if the conditions causing the excessive exhaust dilution or out of range engine speed are corrected.

  iii. Information not permitted during the emissions inspection. The analyzer must not display the emissions readings during the emissions testing procedure.

  iv. Readability of display. The display, when in the exhaust sampling sequences of the emissions inspection, must be readable at a distance of eight feet in a building which meets OSHA lighting standards for a garage environment. Contrast must be adjustable.

  v.   Engine RPM. The analyzer must have the capability to display the engine speed up to four digits during the emissions inspection as well as any other information necessary for the operator to properly conduct an emissions inspection.

  vi. Emissions inspection results.

  (01) At the end of the emissions inspection, the display must show, as a minimum, the emissions results listed below. The emission standards must also be displayed on the screen. The words PASS or FAIL must be displayed beside each result except for CO_2 and O_2.

  (02) Display:

              EMISSIONS RESULTS
          2500 RPM   Idle
          HC: XXXX ppm   XXXX ppm
          CO: XX.XX%   XX.XX%
          CO_2:   XX.X %   XX.X %
          O_2:   XX.X %   XX.X %

  (03) This information must not be displayed until the emissions portion of the inspection is complete.

G. Abort Codes. The EIS must allow the I/M mechanic to abort a test for the reasons listed in the inspection and test procedures found in Section 2 and Section 3. If a vehicle has excessive dilution or is unable to maintain RPM, the emissions inspection must be aborted. The EIS must print the appropriate abort

code and reason to the test record and the VIR.

H. In order to pass the two-speed idle test, the vehicle's exhaust must not exceed the standards listed in the table below (except in the case of a Referee test where an override has been noted).

EXHAUST EMISSION STANDARDS FOR TWO-SPEED IDLE EMISSIONS INSPECTIONS.

(These standards must be obtained from the ESC table, downloaded from the VID.)

Category	Description	CO (Idle) %	CO(2500) %	HC ppm	$CO + CO_2$ % (Minimum)	RPM
Cars (LDGV):						
01	1968 – 71, > 4 cyl	5.0	4.0	1000	8.0	1100
02	1968 – 71, 4 cyl	5.0	4.0	1000	7.0	1100
03	1972 – 74	4.0	3.0	1000	8.0	1100
04	1975 – 80	2.0	2.0	1000	8.0	1200
05	1981 – 83	1.0	1.0	1000	7.0	1200
06	1984 – 93	1.0	1.0	750	7.0	1200
07	1994 +	0.5	0.5	220	7.0	1200
Trucks (LDGT 1 and LDGT 2):						
08	1968 – 72, > 4 cyl	5.0	4.0	1000	8.0	1100
09	1968 – 72, 4 cyl	5.0	4.0	1000	7.0	1100
10	1973 – 78	4.0	3.0	1000	8.0	1100
11	1979 – 83	2.0	2.0	1000	7.0	1200
12	1984 – 93	1.0	1.0	750	7.0	1200
13	1994 +	0.5	0.5	220	7.0	1200
Trucks (HDGV):						
14	1968 – 73 All	5.0	5.0	1000	8.0	1100
15	1974 – 78 All	4.0	4.0	1000	8.0	1100
16	1979 – 93 All	4.0	4.0	1000	8.0	1100
17	1994 + All	1.0	1.0	220	8.0	1100

LDGV   light-duty gasoline-fueled vehicles (passenger cars) not exceeding 8500 lbs. GVWR.

LDGV1   light-duty gasoline-fueled trucks not exceeding 6000 lbs. GVWR (lighter pick-up trucks and vans).

LDGT2   light-duty gasoline-fueled trucks over 6000 lbs. GVWR and not exceeding 8500 lbs. GVWR (heavier pick-up trucks and vans, and many commercial trucks).

HDGV   heavy-duty gasoline-fueled vehicles over 8500 lbs. GVWR

(heavier commercial trucks, buses and motorhomes).

ADEC may, in its discretion, change these standards, as necessary, by changing the values in data table ESC. The cutpoints are the same for Tier 1 and other 1981 plus vehicles. No determination of Tier 1 status is required; the vehicle must be inspected as if it were not a Tier 1 vehicle.

I. Commencement of the Emissions Sampling Period

    i.   Immediately before starting the two-speed idle tailpipe emissions test, the software must require the operator to verify that the type of ignition system entered is correct and allow the I/M mechanic to make corrections as necessary.

    ii.   The sampling period must commence as soon as stability is achieved. Stability is achieved when all of the following conditions are satisfied:

        (01) averaged reading for $CO+CO_2$ over a period of two seconds meet the dilution threshold; engine RPM has been within specified thresholds for at least one second; and

        (02) sample flow rate is adequate to prevent triggering the low flow lockout.

    iii.   After stability is achieved and sampling is initiated, if any of the following conditions occur, the test mode must be restarted:

        (01) the dilution level is below the specified threshold;

        (02) engine RPM is outside the specified thresholds; or

        (03) sample flow rate is inadequate to prevent triggering the low flow lockout.

J. THE 2500 RPM MODE

The 2500 RPM mode must be performed as follows:

    i.   the vehicle transmission must be in neutral or park;

    ii.   the vehicle engine speed must be increased from idle to between 2250 and 2750 RPM and maintained;

    iii.   if the engine speed varies outside the range of 2250 to 2750 RPM for more than two consecutive seconds during a sampling period, the 2500 RPM mode must be invalidated and the 2500 test restarted; if the engine speed

varies outside the RPM range for more than a cumulative total of 10 seconds, the 2500 RPM test mode must be invalidated and another initiated;

iv.   the pass/fail analysis must begin after an elapsed time of 10 seconds and must be based on a simple rolling average of measurements taken over five seconds;

v.   the minimum and the maximum elapsed time for the 2500 RPM mode test must be 30 seconds; the values for this mode must be in the ESC table; and

vi.   the exhaust concentrations must be measured as percent carbon monoxide, carbon dioxide, oxygen and parts per million hydrocarbons after stabilized readings are obtained or (in any event) at the end of 30 seconds.

K. The Idle Test Mode

i.   The vehicle transmission must be in either neutral or park and the parking brake applied. The engine must be operating at curb idle according to manufacturer specifications. The engine speed (RPM) must be in the range of 400 and 1250 RPM for the duration of the test mode. The upper limit may be modified, from the VID by the Department, if a particular make and model must idle at a higher RPM. The software must allow for a change in the RPM range for certain makes and models based on data provided by ADEC as this information is obtained.

ii.   The pass/fail analysis must begin after an elapsed time of 10 seconds and must be based on a simple rolling average of measurements taken over five seconds.

iii.   The idle mode elapsed time must be 30 seconds. The exhaust concentrations must be measured as percent carbon monoxide, carbon dioxide, oxygen and parts per million hydrocarbons after stabilized readings are obtained or at the end of 30 seconds.

2. Testing sequences

A. SEQUENCE #1:

Test Sequence # 1 must be used to test all vehicles, except those mentioned under the test sequences below.

Testing period: 30 seconds for each stage.
First stage: 2500 RPM (± 10 %).
Second stage: Idle RPM.

Basis for test results: Average of last 5 seconds of each sampling period
(or until

simultaneous passing results are obtained).

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

B. SEQUENCE #2:

All 1981- 84 Ford passenger cars with 5.8L (351 CID) engines must be tested using Sequence #2.

Testing period: 30 seconds for each stage.
    Note: Prior to initiating the test, the I/M mechanic must be informed that the vehicle to be tested will require special test procedures and that it is important to follow directions carefully. The I/M mechanic must then be prompted to turn the key off for 10 seconds. At the end of 10 seconds, the analyzer must prompt the I/M mechanic to restart the engine and begin the 2500 RPM test. The software must ensure that there is no RPM signal for 10 seconds prior to starting the 2500 RPM test.

First stage: 2500 RPM ($\pm$10 %).
    Note: Between the test stages, the I/M mechanic must be prompted to turn the ignition off for 10 seconds. The analyzer must ensure that there is no engine RPM signal for at least 10 seconds. At the end of 10 seconds, the software must prompt the I/M mechanic to restart the engine and begin the idle test.

Second stage: Idle RPM (see standards for maximum).

Basis for test results: After the first 15 seconds of each stage, any simultaneous passing readings (averaged over 5 consecutive seconds) collected during each sampling period or, if none, the last 5-second average. The second stage of Sequence # 2 could take as little as 20 seconds if the test conditions are satisfied and the vehicle meets the standards. If the emissions are not within the standards for any 5-second period (following the initial 15-second period), the test must run the full 30 seconds.

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

C. SEQUENCE #3:

All 1984 Jeeps with a 2.5L (150 CID) must be tested using test Sequence # 3.

Testing period: 30 seconds for each stage.

Note: Before the 2500 RPM test starts, the software must display a message to the I/M mechanic indicating that the engine RPM cannot exceed 2650 for this vehicle.

First stage: 2500 RPM (+ 6 %, - 10 %).
Second stage: Idle RPM (see standards for maximum).

Basis for test results: Average of the last 5 seconds of each sampling period (or until simultaneous passing results are obtained).

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

D. SEQUENCE #4:

All 1984 Chrysler/Dodge/Plymouth passenger cars with 2.2L, fuel-injected engines with automatic transmissions must be tested using Sequence # 4.

Testing period: 30 seconds for each stage.
First stage: 2500 RPM (±10 %).
   Note: A message must be displayed indicating that the vehicle being tested will require special test procedures and that it is important that the mechanic follow directions carefully. The I/M mechanic must be prompted to set the parking brake, press the brake pedal and run the IDLE test with the transmission in DRIVE. When the idle test is complete, the I/M mechanic must be prompted to return the transmission to PARK.
Second stage: Idle RPM (see standards for max.).

Basis for test results: Average of last 5 seconds of each sampling period (or until simultaneous passing results are obtained).

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

E. SEQUENCE #5:

All 1984 - 87 BMW models with automatic transmissions, 1983 - 1988 Volvo 740 models with automatic transmissions, and 1986 - 1992 Peugeot 505 models with automatic transmissions must be tested using test Sequence #5. If the engine has been changed to a different year, no matter, the special test sequence applies to the year of the vehicle, not the engine.

Given the problems with the ZF automatic transmission, ADEC prefers that the affected vehicles be tested at its dealerships. Accordingly, if the I/M mechanic

enters an "A" (for automatic) for the transmission type, and if the vehicle make, model and model year match BMW/Peugeot/Volvo criteria, the EIS must display the following message:

BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, IT IS RECOMMENDED THAT IT BE INSPECTED AT ITS DEALERSHIP. IF YOU STILL WISH TO PERFORM THE INSPECTION, YOU

MAY DO SO AT YOUR OWN RISK. PRESS "ENTER" TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST. (ENTER ABORT CODE 14.)

If the I/M mechanic chooses to continue testing the vehicle, the EIS must display the following message before beginning the test sequence:

BEFORE BEGINNING THE EMISSIONS TEST, MAKE SURE THE ENGINE IS AT NORMAL OPERATING TEMPERATURE. IF NOT, THE VEHICLE SHOULD BE DRIVEN UNTIL IT IS. DO NOT WARM THE ENGINE BY RAISING THE RPM ABOVE IDLE WHILE THE TRANSMISSION IS IN PARK OR NEUTRAL.

Perform idle test only (delete the first stage).

Testing period:	30 seconds for idle stage.
Engine Speed:	Idle RPM [Note: One stage only].
Basis for test results:	Average of the last 5 seconds of the sampling period (or until simultaneous passing results are obtained).
Units of test results:	Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

Examples:
  1985 BMW with a ZF transmission and original engine uses test sequence #5 and the emission standards for 1985.
  1985 BMW with a ZF transmission and a 1990 engine uses test sequence #5 and emission standards for 1990.

F. SEQUENCE #6:

All 1985 Ford Ranger 2.3L (140 CID) light duty trucks and 1986 Ford Ranger and Aerostar 2.3L (140 CID) light-duty trucks must be tested using test Sequence #6.

Testing period:	30 seconds for each stage.
First stage:	2500 RPM (±10%).
Second stage:	Idle RPM.

Basis for test results:
  Stage 1:   Average of last 5 seconds of sampling period (or until simultaneous passing results are obtained).

Stage 2: Same as stage 1; however, if the emissions are not within the standards and the idle RPM was below 900, then the I/M mechanic must be prompted to rev the engine so that the idle speed is a minimum of 900 RPM (but not to exceed the manufacturer's specifications), and to continue the test for another 30 seconds. After the first 15 seconds of the repeated second stage, simultaneous passing readings (averaged over 5 consecutive seconds) collected during the sampling period or, if none, the average reading over the last 5 seconds of the stage.

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

G. SEQUENCE #7:

All 1985-1986 GM passenger cars with 5.0L and VIN-Y ("Y" in eighth position) engines must be tested using Sequence # 7.

Testing period: 30 seconds for each stage.
Prior to initiating the test, the I/M mechanic must be informed that the vehicle to be tested will require special test procedures and that it is important to follow directions carefully. The I/M mechanic must then be prompted to start the vehicle and allow it to idle. At the end of 156 seconds, the analyzer must prompt the I/M mechanic to insert the probe and begin the 2500 RPM test. The software must ensure that there is an RPM signal for 156 seconds prior to starting the 2500 RPM test.
First stage: 2500 RPM ($\pm$10 %).
Second stage: Idle RPM (see standards for maximum).

Basis for test results: Simultaneous-passing readings (averaged over 5 consecutive seconds) collected during each sampling period or if none, over the last 5 seconds.

Units of test results: Concentration measurements: PPM HC, % CO, % CO_2, and % O_2.

3. Vehicle Preconditioning Procedures (before second chance test)

A. General Requirements

i. For "post conditioning" (i.e., preconditioning before the second chance test) some or all vehicles will receive a three-minute "post conditioning" at 2500 RPM before the second chance test sequence. For example, if a vehicle fails either of the first chance emission tests, the analyzer must instruct the I/M mechanic to precondition the vehicle and then run the second chance test. The EIS must also use special test sequences for the second chance test if

they were used for the first test. For example: if the EIS uses special test Sequence #2 and the vehicle requires preconditioning, the EIS must use special test Sequence #2 for the second chance test. The EIS must also follow any RPM restrictions that the special test sequence may require, i.e., a 1985 BMW with a ZF transmission must NOT be preconditioned at high RPM.

ii.   If the RPM limits are exceeded for more than 10 seconds cumulative, the preconditioning must be repeated after a return to idle RPM for at least 30 seconds. The EIS software must provide for the preconditioning sequences set out at B. -- D. of section 3.3-1, V, d.3.

iii. The manufacturer must provide for the capability to utilize different preconditioning procedures. The preconditioning procedure number must be recorded on the test record in the *Preconditioning Procedure* field.

iv.   The analyzer must display the engine speed and the time remaining during each stage of preconditioning. The number of the preconditioning procedure must be recorded on the test record automatically by the analyzer. If no preconditioning procedure was used (vehicle passed the emissions portion of the test the first time), this record field must be filled with a space.

v.   The analyzer must start the second chance test as soon as the EIS detects engine RPM within the idle RPM range. The EIS must perform the emissions measurement in each mode tested for 30 seconds. After the second chance, the EIS must allow the I/M mechanic to complete the inspection.

vi.   Programming Criteria:

(01) For all procedures - The analyzer must automatically instruct the I/M mechanic to initiate the preconditioning procedure before the test can proceed when a vehicle has failed the tailpipe portion of the emissions test. The analyzer software must select and display only the appropriate preconditioning procedure based on the vehicle make and model year information entered by the I/M mechanic.

(02) For procedure #1 & #2 - A message must be displayed instructing the I/M mechanic to remove the exhaust probe (optional), increase the engine RPM to 2500 (±300) and hold it there for 3 minutes. The analyzer must detect a signal in the proper RPM range for 3 minutes within a 3-minute and 15-second period, with no single deviation exceeding 5 seconds. A message must be displayed instructing the I/M mechanic to adjust the engine RPM, restart the test or abort the test as appropriate if the RPM is outside of the specified range. The preconditioning period must begin as soon as the engine RPM is stable (for a period of 1 second) and within the proper range. To avoid

loading the sample system with vehicle exhaust during the
preconditioning process, the analyzer must either back purge during the
preconditioning procedure or prevent preconditioning if the probe is in
the tailpipe. Preconditioning loading prevention can be determined by
checking for emissions prior to or during the preconditioning sequence.

(03) For procedure #1 only - When the preconditioning period is complete,
the I/M mechanic must be instructed to allow the vehicle to return to
idle and the analyzer must ensure that the engine speed is reduced for at
least 10 seconds, but no more than 45 seconds. If the engine speed is
reduced for less than 10 seconds or more than 45 seconds, a message
must be displayed instructing the I/M mechanic to either restart the
preconditioning procedure or abort the test. Messages indicating the
appropriate ignition key on/off and retest instructions must be displayed
at the end of the 10-second idle period. The I/M mechanic must be
instructed to strike the ENTER key as soon as possible after the 10
second period of idling ends.

(04) The analyzer must display the engine speed and the time remaining
during each stage of the preconditioning sequence. The number of the
preconditioning procedure must be automatically recorded by the
analyzer on the test record . If no preconditioning procedure was used
(e.g., the vehicle passed the first tailpipe emissions portion of the test
the first time) this record must be filled with a blank space.

vii. Display Prompt:

REMOVE THE EXHAUST PROBE FROM .THE TAILPIPE.
Note: This is optional depending on the manufacturer's recommendations
and procedures to prevent particle loading during preconditioning.

B. PROCEDURE #1: (For All Vehicles Except Those Covered by Procedures #2
and #3)

i.   Display Prompt:

OPERATE THE VEHICLE AT 2500 ±300 RPM FOR THREE MINUTES WITH
THE TRANSMISSION IN "PARK" OR "NEUTRAL."

AT THE END OF THE THREE-MINUTE PERIOD, ALLOW THE VEHICLE TO
RETURN TO IDLE AND STABILIZE, BUT DO NOT TURN THE IGNITION
SWITCH OFF.

INSERT THE PROBE INTO THE TAILPIPE.

AT THE END OF THE 10-SECOND PERIOD, IMMEDIATELY BEGIN THE
EMISSIONS TEST.

ii.   Programming Criteria:

Within 30 seconds of having completed the three-minute portion of the pre-conditioning procedure, the I/M mechanic must release the throttle, insert the probe (if it was removed) and return the engine to 2500 (±250) RPM if the vehicle initially failed the 2500 RPM portion of the test. The 30-second time period must begin when the engine RPM drops below 2200. The EIS must provide prompts indicating when the I/M mechanic is to release the throttle and insert the probe (if applicable) and increase the engine RPM to the appropriate range as specified as soon as the probe has been inserted. The emissions test must begin as soon as the engine RPM reaches the appropriate range. The EIS must display the time remaining before the preconditioning period is to be restarted or the test aborted. Vehicles that fail the idle portion of the test will only be required to perform the idle portion of the second chance test after the pre-conditioning warm-up period.

C. PROCEDURE #2:   (FOR 1981-86 FORDS AND 1984-85 HONDA PRELUDES)

i.   Display Prompt:

REMOVE THE EXHAUST PROBE FROM THE TAILPIPE.
Note: This is optional and depends upon the manufacturer's recommendations and procedures for preventing particle loading during preconditioning.

OPERATE THE VEHICLE AT 2500 ±300 RPM FOR 3 MINUTES WITH THE TRANSMISSION IN "PARK" OR "NEUTRAL."

AT THE END OF THE 3-MINUTE PERIOD, ALLOW THE VEHICLE TO RETURN TO IDLE AND IMMEDIATELY TURN THE IGNITION KEY OFF.

INSERT THE PROBE INTO THE TAILPIPE.

LEAVE THE IGNITION OFF FOR 10 SECONDS, THEN RESTART THE ENGINE AND PROCEED IMMEDIATELY WITH THE EMISSIONS TEST.

ii.   Programming Criteria:

Within 30 seconds of having completed the three-minute portion of the preconditioning sequence, the I/M mechanic must release the throttle, turn off the ignition for at least 10 seconds, insert the probe, if applicable, and return the engine to 2500 (± 250) RPM. The 30-second time period must begin when the engine RPM drops below 2200. The EIS must provide prompts indicating when the I/M mechanic is to release the throttle, turn the ignition key off, insert the probe, and then restart the engine and immediately increase the engine RPM to the appropriate range as specified.

The emissions test must begin as soon as the engine RPM reaches the appropriate range. The EIS must display the time remaining before the preconditioning period is restarted or the test aborted.

D. PROCEDURE #3:   (For "ZF" Automatic Transmission equipped vehicles)

Given the problems with the ZF automatic transmission, it is recommended that the affected vehicle be tested at its dealership. Accordingly, if the I/M mechanic enters an A (for automatic) for the transmission type, and if the vehicle make, model and model year match BMW/Peugeot/Volvo criteria, the EIS must display the following message:

Display Prompt:

BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, IT IS RECOMMENDED THAT IT BE INSPECTED AT ITS DEALERSHIP. IF YOU STILL WISH TO PERFORM THE INSPECTION, YOU MAY DO SO AT YOUR OWN RISK. PRESS "ENTER" TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST AND ENTER ABORT CODE 14.

If 1984 -1987 BMW models with automatic transmissions, 1986 - 1992 Peugeot 505 models with automatic transmissions, or 1985 - 1988 Volvo 740 models with automatic transmissions fail the first chance, display the following message:

DUE TO POSSIBLE SERIOUS TRANSMISSION DAMAGE, DO NOT RAISE THE ENGINE SPEED ABOVE IDLE RPM WHILE THE TRANSMISSION IS IN NEUTRAL OR PARK. IF THE VEHICLE NEEDS TO BE PRECONDITIONED, DRIVE IT UNTIL IT HAS REACHED OPERATING TEMPERATURE.

E. Error Messages:

For all procedures:

NO RPM SIGNAL - MAKE SURE THE TACH LEAD IS CONNECTED.

For procedures #1 & #2:

ENGINE RPM DROPPED BELOW 2200 RPM - RAISE THE ENGINE SPEED TO 2500 RPM AND HOLD IT THERE FOR 3 MINUTES.

For procedures #1 & #2:

ENGINE RPM INCREASED ABOVE 2800 RPM - REDUCE THE ENGINE SPEED TO 2500 RPM AND HOLD IT THERE FOR 3 MINUTES

VI.   RECORDING TEST RESULT DATA

a. **If a vehicle receives a second-chance test, the emissions results of both tests must be stored in the test record**. The results for either or both tests must not be written to the test record until the pass/fail decision has been made by the EIS.

b. **At the end of the emissions inspection, the display must show, as a minimum, the following emissions results**. The emission standards must also be displayed to the screen.

1. The words PASS or FAIL must be displayed beside each result except for CO_2 and O_2.

<div align="center">

Emissions Results

</div>

	2500 RPM	Idle	
HC:	XXXX ppm	XXXX ppm	PASS or FAIL
CO:	XX.XX%	XX.XX%	PASS or FAIL
CO_2:	XX.X %	XX.X %	
O_2:	XX.X %	XX.X %	

2. This information must not be displayed until the emissions portion of the inspection is completed.

3. Raw HC, CO, CO_2 and O_2 readings must all be recorded in the test record.

VII.   REPAIR DATA ENTRY PROCEDURE

Upon completion of an after-repairs ("A") test, entry of the repairs performed on the vehicle must be required prior to allowing the mechanic to proceed to the next item.

a. **Repair Categories**

1. Display Prompt:

REPAIR ACTION CATEGORIES.

SELECT THE APPROPRIATE VEHICLE SYSTEM IN WHICH A REPAIR WAS PERFORMED. ENTER "Y" FOR EACH SYSTEM THAT INCLUDED A REPAIR, PART REPLACEMENT OR ADJUSTMENT. ENTER "W" FOR REPAIRS THAT HAVE BEEN COVERED BY A MANUFACTURER'S WARRANTY.

<div align="center">

VEHICLE SYSTEMS

</div>

_____ EGR SYSTEM
_____ ELECTRICAL/ELECTRONIC SYSTEM
_____ EVAPORATIVE CONTROL SYSTEM

_____ EXHAUST SYSTEM
_____ IGNITION SYSTEM
_____ INTAKE/FUEL INDUCTION SYSTEM
_____ INTERNAL ENGINE
_____ PCV SYSTEM
_____ OTHER

2. Programming Criteria:

A. The software must display the repair categories listed above.

B. Referee I/M mechanics (with an emissions license type "R" per the TECH table in Section 4) must be the only ones allowed to enter an "O" (for override) on any repair category.

C. The EIS must only accept "Y," "W" or "O" for any of the entries. Items not selected shall remain blank on the test record.

D. The analyzer must allow the mechanic to review and modify all repair entries prior to proceeding to the next part of the I/M test. The manufacturer must ensure that modifying the repair entries does not result in any non-specified screen prompts or incorrect data entries in the test record. This data is stored in the EIS table.

3. Error Messages:

NO VALUE HAS BEEN ENTERED - TRY AGAIN.
THE REPAIR CODE IS NOT VALID - TRY AGAIN.

b. Parts and Labor Cost (only for test type "A")

1. Display Prompt:

ENTER THE PARTS AND LABOR COST:

ENTER THE COST TO THE MOTORIST FOR PARTS AND LABOR COMBINED. ROUND TO THE NEAREST WHOLE DOLLAR AMOUNT. IF THERE WAS NO CHARGE FOR THE PARTS OR LABOR, ENTER "0." IF REPAIRS WERE PERFORMED UNDER AN EMISSIONS WARRANTY, ENTER "0."

2. Programming Criteria:

A. A decimal point entry must not be accepted.

B. The repair cost entry must be recorded in the EIS table.

C. The analyzer must allow entry of a zero dollar amount.

3. Error Messages:

> NO VALUE HAS BEEN ENTERED - TRY AGAIN.

VIII. FINAL RESULTS AND PRINTING OF VIR

a. Overall Pass/Fail Determination

1. If the vehicle test has not been aborted and the vehicle did not fail any portion of the testing procedure, or if the failing portion of the test received a Referee Override, the analyzer must issue a "PASS."   A corresponding overall result of "P," "F" or "A" must be recorded in the EIS file.

2. The words "PASS," "FAIL" or "ABORTED" must be written, as appropriate, in the OVERALL TEST result block of the VIR.

3. For a passing test, the EIS must obtain the next sequential sticker number from the EIS sticker number inventory and must calculate the month/year expiration using the programming criteria of the **Expiration month and year selection**.

4. For a passing test, the EIS must prompt the I/M mechanic to verify the sticker number.

b. Previous Sticker Entry

1. Display prompt:

DOES THIS VEHICLE HAVE AN EXISTING STICKER? (Y OR N)

2. Programming Criteria:

If "N," then go to **(c) Sticker Number Verification.**
If "Y," then display:
SCAN OR ENTER THE EXISTING STICKER NUMBER AS DISPLAYED ON THE VEHICLE.

Programming Criteria:
The number must be 9 characters in length.
The number entered must be recorded in the EIS file.
The VID may provide the value for the previous sticker number, as returned in the VEHICLE_DATA interface.

c. Sticker Number Verification

1. Display prompt

IS THE NEXT STICKER NUMBER XXXXXXXX? (Y OR N)
2. Programming Criteria:

A. If "Y," go to **(d) Print Certificate/Insert.**

B. If "N," then display:

ENTER THE NUMBER OF THE NEXT STICKER.

C. The mechanic must enter the first 8 digits of the number from sticker. The last "C" must be automatically entered by the EIS.

D. The EIS must only accept sticker numbers that are within the sequence of numbers already loaded.

E. After the mechanic enters the sticker number, the software must adjust its sticker count to agree with the entered number and must display the following prompt regarding the discrepancy in the sticker numbers between that originally displayed by the analyzer and the new number entered by the mechanic:

WHAT HAPPENED TO THE UNISSUED STICKER(S)?
            1 = DAMAGED/VOIDED
            2 = MISSING/STOLEN

a.) If "1" is selected,

(01) record the sticker number in the Sticker Table with a "2" in the Reason_Code field; and

(02) record the sticker number to the Void_Sticker_Insert procedure with a "D" in the VOID_Code Field.

b.) If "2" is selected,

(01) record the sticker number in the Sticker Table with a "3" in the Reason_code field; and

(02) record the sticker number to the Void_Sticker_Insert procedure with an "S" in the VOID_Code Fields.

c.) Display a message that states:

> IMMEDIATELY REPORT ANY MISSING OR STOLEN STICKERS
> TO YOUR LOCAL I/M PROGRAM OFFICE AND REQUEST A
> NOTIFICATION REPORT FORM.

d. Print Certificate/Insert

1. If the "No Certificate Print Date" in the REGION table is blank or the current system date is less than the "No Certificate Print Date," the EIS must print the certificate as described in Appendix C. If the current system date is greater than or equal to the "No Certificate Print Date," only the sticker insert will be printed as shown in Appendix C.

2. If the analyzer finds any problem during the printing process, the analyzer must show the appropriate error message and must await an entry from the keyboard before resending a print command. The analyzer must not continue until the printer problem is corrected.

3. Display Prompt:

> WAS THE CERTIFICATE/STICKER INSERT PRINTED PROPERLY?

4. Programming Criteria:

> If the response is "Y," proceed to (e) Sticker Placement.
> If the response is "N," display an intermediate screen to allow the mechanic to correct the printer problem. Then, prompt the mechanic to print again.

e. Sticker Placement

1. Display prompt:

> REMOVE PREVIOUS STICKER (AS NEEDED).
> AFFIX STICKER TO CERTIFICATE AND VEHICLE.
> ARE ALL STICKERS PROPERLY INSTALLED?

2. Programming Criteria:

    A. If "Y," the sticker/certificate number must be recorded in the test record, and in the Sticker Table with a "1" in the Reason_Code field.

    B. If "N," then display:

> KEEP DAMAGED STICKER(S) FOR AUDIT PURPOSES. PRESS "ENTER" TO
> ISSUE THE NEXT STICKER NUMBER.

(01) Record the damaged sticker number to the Void_Sticker Insert procedure with a D in the Void_Code, and record damaged sticker number into Sticker Table with a "2" in the Reason_Code field.

(02) Advance to the next sticker number in inventory.

(03) Go to **(c) Sticker Number Verification.**

f.   Local Data Recording

The EIS must write the entire test record to the EIS.

g. VID Data Transfer

1.   Display:

TRANSMITTING DATA TO VID. PLEASE WAIT.

2. Programming Criteria:

A. The analyzer must attempt to contact the VID.

B. All stored test records and voided stickers number must be transmitted to the VID.

C. Upon successful data transfer to the VID, data must be purged from the EIS table and be archived in the appropriate HST file. Archiving must also occur if the data transmittal was unsuccessful.

h.   Print VIR

1. The EIS must print the VIR as described in Appendix D.

2. If the analyzer finds any problem during the printing process, the analyzer must show the appropriate error message and must await an entry from the keyboard to retry. The analyzer must not continue until the printer problem is corrected.

3. Display Prompt:

PRINTING VEHICLE INSPECTION REPORT (VIR).

4. Programming Criteria:

    A. The VIR must be presented to the customer.

    B. The analyzer must return the I/M mechanic to the Vehicle Emissions Inspection Menu after successful printing of the VIR.

5. Error Messages:

THE PRINTER IS OUT OF PAPER. PLEASE CORRECT THIS PROBLEM AND PRESS ANY KEY TO CONTINUE.
THE PRINTER IS NOT RESPONDING. PLEASE CORRECT THE PROBLEM AND PRESS ANY KEY TO CONTINUE. IF THE PROBLEM CANNOT BE RESOLVED, PLEASE CONTACT YOUR SERVICE VENDOR.

3.3-2   ANALYZER MAINTENANCE MENU (Item 2 from Vehicle Emissions Inspection Menu)

    The Analyzer Maintenance Menu must be activated by an entry from the Vehicle Emissions Inspection Menu. This will present the mechanic with a set of maintenance functions that may be performed by the I/M mechanic.

    Display Prompt One must be displayed on the screen. The I/M mechanic must select the maintenance function to be performed from the options listed in Display Prompt One:

        ANALYZER MAINTENANCE MENU ITEMS
            1) GAS CALIBRATION AND LEAK CHECK
            2) LEAK CHECK ONLY
            3) GAS CALIBRATION ONLY
            4) STATUS SCREEN

  a. Gas Calibration and Leak Check

    1. When the I/M mechanic selects one, "1," at Display Prompt One, the analyzer must initiate the gas calibration and leak check sequence.

    2. A gas calibration and leak check is a required feature. Selection of this item must bring up a set of both gas calibration and leak check procedures. The procedures must be user-friendly and must indicate every step needed to properly perform the required gas calibration and leak check (including when it is necessary to turn the gas cylinder valve on and off).   The procedures must include a prompt to scan the calibration gas bottle bar code. Selected scanned data must be recorded in the CAL table as detailed in Section 4. If the bar code reader is unavailable, manual entry of the gas values is allowed. Calibration gases will not be considered to be expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas will

not be cause for a gas calibration failure. Gas calibration and leak check procedures must be approved by ADEC. Results of the leak check and the gas calibration must be displayed on the screen and recorded on the test calibration record. The system must preclude Official I/M Test (Vehicle Emissions Inspection Menu option 1) if a gas calibration and leak check are not performed and passed. If the analyzer fails the gas calibration or leak check, a message must be displayed indicating that it failed and assist the I/M mechanic in correcting the problem before the I/M mechanic is instructed to call for repairs. Emissions-related inspection functions must locked out pending service repairs.

3. When the gas calibration and leak check is completed, the analyzer must return to the Main Menu.

b. Leak Check Only

1. When the I/M mechanic selects two, "2," at Display Prompt One, the analyzer must initiate a leak check sequence. Selection of this item must bring up a set of leak check procedures.

2. The procedures must be user friendly and must indicate every step needed to properly perform the leak check (including when it is necessary to turn the gas cylinder valve on and off). Leak check procedures must be approved by ADEC. Results of the leak check must be displayed to the screen and recorded on the test record. If the analyzer fails the leak check, a message must be displayed indicating that it failed and assist the I/M mechanic in correcting the problem before the I/M mechanic is instructed to call for repairs.

3. When the leak check is completed, the analyzer must return to the Analyzer Maintenance Menu (Display Prompt One).

4. Calibration gases are not to be considered expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas is not cause for a gas calibration failure.

c. Gas Calibration Only

1. When the operator selects three, "3," at Display Prompt One, the analyzer must initiate a gas calibration sequence.

2. Selection of this item must bring up a set of gas calibration procedures. The procedures must be user friendly and must indicate every step needed to properly perform the gas calibration (including when it is necessary to turn the gas cylinder valve on and off). The procedures must include a prompt to scan the calibration gas bottle bar code. If the bar code reader is not available, manual entry of the gas values is allowed. Calibration gases are not to be considered expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas is not be cause for

a gas calibration failure. Procedures must be approved by ADEC. Results of the gas calibration must be displayed to the screen and recorded on the test record. If the analyzer fails the gas calibration, a message must be displayed indicating that it failed and assist the I/M mechanic in correcting the problem before the I/M mechanic is instructed to call for repairs.

3. When the gas calibration is completed, the analyzer must return to the Analyzer Maintenance Menu (Display Prompt One).

d. Status Screen

1. When the I/M mechanic selects "4" at Display Prompt One, the analyzer must display the Status Screen. The analyzer must use information stored in the CAL table file and other sources to generate the Status Screen.

2. The structure of the Status Screen:

> STATION NUMBER: XXXXXXXX
> ANALYZER NUMBER: XXXXXXXX
> SPAN GAS CYLINDER #1VALUES:
> PROPANE XXXX
> CO XX.XX
> CO_2 XX.XX
>
> SPAN GAS CYLINDER #2 VALUES:
> PROPANE XXXX
> CO XX.XX
> CO_2 XX.XX
>
> DATE AND TIME OF THE LAST GAS CALIBRATION AND LEAK CHECK: MM/DD/YYYY HH:MM:SS
>
> NUMBER OF TEST RECORDS STORED ON SYSTEM: XXXXX
> (NOTE: NUMBER OF TESTS IS COMPUTED BY ADDING THE RECORDS STORED IN EIS AND EISHST.)
>
> TOTAL NUMBER OF INSPECTIONS SINCE THE LAST VID CONNECTION: NNNN   (NOTE: COUNT INSPECTIONS IN EIS)
>
> DATE ANALYZER WAS LAST SERVICED: MM/DD/YYYY
>
> CURRENT DATE AND TIME: MM/DD/YYYY HH:MM:SS
> SOFTWARE VERSION NUMBER: XX.XX

3. After the I/M mechanic presses the <Enter key>, the analyzer must return to the Analyzer Maintenance Menu.

3.3-3 MANUAL TEST MODE (Item 3 from Vehicle Emissions Inspection Menu)

Manual Test Mode
When the EIS has met the warm-up criteria, selection of the Manual Testing Mode menu item must cause the EIS to conduct an automated electronic zero and span and then begin taking emission readings. The emission readings must be displayed in large characters easily read by a person with 20/20 vision from a distance of eight feet, in the following format:

Emission	Reading
HC	XXXX ppm
CO	XX.XX %
CO_2	XX.X %
O_2	XX.X %
RPM	XXXX

3.3-4 VIR REPRINT PLUS TEST RECORD SEARCH
(Item 4 from Vehicle Emissions Inspection Menu)

a. **The analyzer must list the last 30 days of inspections in chronological order by date and begin time of the inspection.**

b. **The list must display the date, begin time, VIN, vehicle license, year, make, model and I/M mechanic identification number.**

c. **The software must permit the user to scroll through the list and select a single vehicle inspection record for display.**

d. **Once a record is located, the user must be allowed to review the complete vehicle inspection record and print an individual record using the VIR's printer.**

1. Both the on-screen and printed report must be the same, in an easily read formatted report of the data. Field identifiers must be clear labels of the data fields.

2. The analyzer must also be capable of printing a replacement VIR once the test record has been selected.

A. The replacement VIR must clearly be labeled "REPLACEMENT VIR."

B. If any data is not available to be printed on VIR, the field must print "Data not available."

    e. **A function key or other entry method must return the user to the Vehicle Emissions Inspection Menu.**

3.4   OPERATOR TRAINING (Item 2 from Main Menu)

    a. **Training Test**
    The Training Test function must be activated by an entry from the Main Menu.

    b. **Programming Criteria:**

      1. The Training Test function must allow the operator to conduct training and to generate a "training" VIR, that is a voided VIR.

      2. Lockouts or missing data from ADEC must not prevent the EIS from allowing a Training Test to be performed.

      3. Prompts must be provided to allow the operator to perform a practice (training) inspection.

      4. The choice of inspections ("I" = initial, "A"= after repairs, "R"= referee) must be the same as for regular Emissions inspection.

      5. The certificate number section of the test must be bypassed, and the loaded certificate inventory must not be modified. A certificate number must not be printed on the VIR.

      6. The VIR must have the words "Training Test," instead of inspection results, at the top of the form.

      7. The word "VOID" must be printed in large letters on the face of the VIR.

      8. The analyzer must not record the training record in the EIS, but must contact the VID in the same manner as a regular emissions inspection.

      9. The analyzer must print emission readings on the VIR for vehicles that require a tailpipe test.

      10. The overall result field on the VIR must be blank.

      11. When the Training Test inspection is complete, the analyzer must return to the Main Menu.

3.5   **STATION MENU**
The analyzer must display the following prompt:

     STATION MENU

     1) STICKER USAGE REPORT
     2) VID COMMUNICATIONS DIAGNOSTICS
     3) VID DATA REFRESH
     4) LOCKOUT UPDATE
     5) LOAD STICKERS
     6) ENTER DAMAGED/MISSING STICKERS
     7) ISSUE REPLACEMENT STICKERS

a. **Print Sticker Usage Report** (Item 1 from Station Menu)

1. This selection must display and print a report of stickers issued by the analyzer for a maximum of the past 31 days.

2. Display Prompt:

    A. ENTER DATE RANGE FOR ISSUED STICKER REPORT (MAXIMUM 31 DAYS): MM/DD/YYYY TO MM/DD/YYYY

    B. PROCEED WITH REPORT? YES OR NO

3. Programming Criteria:

    A. The default date range must be the current date in both fields;

    B. maximum range is 31 days; and

    C. the report must display:

        i.   date of report;

        ii.   station license;

        iii. station name, address, and phone number;

        iv. analyzer id;

        v.   the following footer on the report if the report contains Missing, Lost, or Stolen certificates:

IMMEDIATELY REPORT ANY MISSING OR STOLEN STICKERS TO YOUR LOCAL I/M PROGRAM OFFICE AND REQUEST A NOTIFICATION REPORT FORM.

vi.   sticker details:

(01) date of issue

(02) sticker number

(03) reason for issue: "Emissions Inspection, Voided/Damaged, Lost/Stolen, or Replacement ;" and

(04) use all details in sticker file.

b. **VID Communications Diagnostics** (Item 2 from Station Menu)

"VID Communications Diagnostics" must be used to diagnose communication-related problems. The following diagnostic tests must be provided:

1. Modem Diagnostics

A. Modem serial port diagnostics must be manufacturer provided pursuant to manufacturer-specific hardware configurations.

B. Following completion of the diagnostics, the analyzer must report the results on-screen,
as follows:

i.   MODEM DIAGNOSTICS PASSED; or

ii.   MODEM DIAGNOSTICS FAILED. CONTACT MANUFACTURER FOR SERVICE.

2. Dial Tone Check

A. The analyzer must attempt to determine if the modem detects dial tone.

B. Following completion of the dial tone, check the analyzer must report the results on-screen, as follows:

i.   DIAL TONE CHECK PASSED; or

ii.   DIAL TONE CHECK FAILED. VERIFY THAT THE ANALYZER PHONE CORD IS PROPERLY CONNECTED. TRY CONNECTING A STANDARD PHONE TO THE WALL PHONE OUTLET AND LISTEN FOR A DIAL TONE.

IF NO DIAL TONE IS PRESENT, CONTACT THE PHONE COMPANY. IF A
DIAL TONE IS PRESENT, CONTACT THE ANALYZER MANUFACTURER
FOR SERVICE.

3. VID Connection And Data Transfer Check

The analyzer will connect to the VID and launch the SECURITY_LOGIN interface
as directed in the data communication specification.
Programming Criteria**:**

    i.   Upon successful login to the VID, the EIS must display the following
          message:

          VID COMMUNICATIONS PASSED.

    ii.   Upon unsuccessful login to the VID, display the appropriate error message
          as directed in the data communications specification.

          If the EIS cannot successfully connect to the VID, display the following
          message:

          VID COMMUNICATIONS FAILED.

c. **VID Data Refresh** (Item 3 from Station Menu)

1. This feature must allow station personnel to request that the VID update key
analyzer data files, such as reference tables, I/M mechanic information, lockouts and
program data.

2. The EIS must display a field with the default VID phone number. This number must
be editable in this data refresh session only. This feature must allow for recovery in
the event of a corrupted or incorrect VID phone number entry.

3. The analyzer must overwrite the existing tables with the updated data received from
the VID.

4. The analyzer must synchronize its date and time with the VID.

5. Programming Criteria

    A. The existing LOCKOUT and LOADSTICKER tables must be sent to the VID
         and processed by the VID before the tables are downloaded from the VID.

    B. Upon completion of the "VID Data Refresh" procedure the analyzer must display

the following message:

DATA FILES HAVE BEEN SUCCESSFULLY REFRESHED.

C. The analyzer must display the updated list of I/M mechanic license numbers.

D. The analyzer must allow the printing of the updated list, including the station name,
address, station license number and date of report as well as each I/M mechanic's
license number and full name.

E. The analyzer must not display the I/M mechanic access codes during screen
display or printing of the I/M mechanic information.

F. If access to the VID fails, display an appropriate message as noted in the data
communications specification.

d. Lockout Update

1. This feature must allow station personnel to request that the VID update the lockout.
It is generally used in conjunction with a phone call to the local I/M program office.

2. Programming Criteria

A. The existing LOCKOUT and LOADSTICKER tables must be sent to the VID
and processed by the VID before the tables are downloaded from the VID.

B. Upon completion of the "VID Data Refresh" procedure, the analyzer must
display the following message:

LOCKOUTS HAVE BEEN UPDATED.

e. View/Load Sticker Numbers (Item 5 from Station Menu)

1. When the I/M mechanic selects "5" at Display Prompt One, the analyzer must
display the Sticker View/Load Screen. A mechanic access code is required to load
sticker numbers. The STATION table "allow_manual_cert_load" field must be "T"
to permit loading sticker numbers. If the STATION table
"allow_manual_cert_load" field is an "F", only viewing must be permitted. The
Sticker View/Load Screen must first show a history of sticker numbers loaded into
the analyzer. Loaded sticker numbers may either come automatically from the VID
or manually from the analyzer and the loading history must be noted as such on the

screen.   The option to manually load sticker numbers into the analyzer must be

presented.

2. Selection of this item must cause the analyzer to instruct the mechanic to enter the first and last serial numbers on the stickers placed into inventory. The mechanic must be prompted 1) to enter the numbers of the first and last sticker using the bar code scanner (see Appendix A), and 2), if the bar-coded numbers cannot be scanned, to enter the numbers manually via a double blind entry protocol. The following display must be used to load sticker numbers:

     SCAN THE FIRST AND LAST SERIAL NUMBERS OF THE STICKERS TO BE
     LOADED INTO INVENTORY. IF THE BAR-CODED NUMBERS ON THE
     STICKERS CANNOT BE SCANNED, ENTER THE NUMBERS MANUALLY
     TWICE.

3. The sticker numbers must be loaded into the LOADSTICKER table.

4. The analyzer must sense when the sticker numbers have run out and display a message advising the mechanic to reload. The analyzer must require the entry of a new set of serial numbers before another I/M test can be initialized.

5. When loading sticker numbers manually, the mechanic must enter one alpha character (either "A" for Anchorage or "F" for Fairbanks), followed by seven numeric characters for the beginning sticker number. The EIS must be programmed to ensure that the beginning and ending sticker numbers have the same number of characters and begin with the same alpha prefix. The test record must contain nine characters for the certificate number, the last being "C", which is entered automatically by the EIS.

6. The number of remaining stickers must be displayed each time a sticker is issued. The EIS must prominently display a warning message to the operator when the number of sticker numbers is less than five. If the EIS is out of sticker numbers, a message must be displayed and remain on the screen whenever "Official I/M Test" is selected from the Vehicle Emissions Inspection Menu.

f. **Enter Damaged/Missing/Sticker** (Item 6 from Station Menu)

1. Enter Damaged/Missing/Sticker must be activated by an entry of "6" from the Station Menu. The mechanic must enter the mechanic's access code to enter these sticker numbers.

2. Menu Display Prompt (select appropriate message):

     (1) RECORD A VOIDED OR DAMAGED STICKER
     (2) RECORD A MISSING OR STOLEN STICKER

    A. If Voided or Damaged Sticker is selected:

Display Prompt:

RECORD THE NUMBER OF THE VOIDED OR DAMAGED STICKER AND
RETAIN THE STICKER FOR AUDIT PURPOSES.
ENTER THE VOIDED OR DAMAGED STICKER NUMBER:

Programming Criteria:

i. Record the sticker number to the Void_Sticker_Insert procedure with a "D"
    in the VOID_Code field.

ii. Record the sticker number to Sticker Table with "2" in Reason_Code field.

B. If Missing or Stolen Sticker is selected:

Display Prompt:

RECORD THE NUMBER OF THE MISSING OR STOLEN STICKER FOR AUDIT
PURPOSES. IMMEDIATELY REPORT ANY MISSING OR STOLEN STICKERS
TO YOUR LOCAL I/M PROGRAM OFFICE AND REQUEST A NOTIFICATION
REPORT FORM. ENTER THE MISSING OR STOLEN STICKER NUMBER:

Programming Criteria:

i. Record the sticker number to the Void_Sticker_Insert procedure with an "S"
    in the VOID_Code field.

ii. Record the sticker number to the Sticker Table with "3" in Reason_Code
     filed.

3. Programming Criteria:

A. Entry of a nine-digit sticker number must be required. The first 8 digits of the
number must be entered by the mechanic. The ending "C" must be automatically
entered by the EIS.

B. A record must be recorded in the STICKER table for transmission to the VID.

C. Error Message:

INCOMPLETE STICKER NUMBER – PLEASE RE-ENTER

D. A report must be printed to the VIR printer for all void/damaged/missing/stolen
stickers and must include the following data:

i. date of report;

ii.   station license;

iii.   station name, address, and phone number;

iv.   analyzer id;

v.   I/M mechanic license number;

vi.   I/M mechanic name (if known); and

vii.   sticker number.

g. Issue Replacement Sticker (Item 7 from Station Menu)
Access to the replacement sticker item in the Station Menu must be restricted. The
default must be "F" in the Station Table "Allow_Replacement" field, which must result
in the Issue Replacement Sticker item to be grayed out. If 'T' is in the
"Allow_Replacement" field of the Station Table, then the replacement sticker item will
be engaged. There must be three options available to the I/M mechanic to access the test
associated with the sticker being replaced: the number of the sticker to be replaced, the
RRN for the vehicle, or the VIN for the vehicle. The I/M mechanic must enter at least
one of these three identifying numbers in order for the EIS to make a VID connection
and there must be a test record match found in the VID in order to obtain a replacement
sticker for the vehicle. If these conditions are not met, the motorist must not be issued a
replacement sticker by the station.

1. Enter the I/M mechanic access code,

Following the logic for I/M mechanic access code data entry found at section 3.3-1,
II, a. of this Part I.

2. The mechanic must enter the sticker number of the sticker being replaced.

A. Display Prompt:

DO YOU HAVE THE NUMBER OF THE STICKER YOU WANT TO REPLACE?
ENTER "Y" FOR YES OR "N" FOR NO.

B. Programming Criteria:

i.   If the number for the sticker to be replaced is known, the EIS must prompt
     the I/M mechanic to enter that number.

ii.   If the number for the sticker to be replaced is not known, the EIS must
      proceed to the data entry prompt for Vehicle Identification, RRN.

C. Error Messages:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.
ENTRY IS NOT VALID – TRY AGAIN.

D. Display Prompt:

SCAN OR MANUALLY ENTER THE NUMBER OF THE STICKER BEING
REPLACED.

E. Error Messages:

INVALID STICKER NUMBER – TRY AGAIN.
NO VALUE HAS BEEN ENTERED – TRY AGAIN.

F. Programming Criteria:

i. Upon entry of the sticker number by the I/M mechanic, the VID must
commence initialization and a search for the associated test record.

ii. If the associated test record is found, the EIS must proceed to previous test
record verification to verify the test record of the vehicle receiving the
replacement sticker.

iii. If the VID connection is not successful or if the associated test record is not
found, the EIS must prompt the I/M mechanic to refer the motorist to the
Referee Facility or to the local I/M Program Office.

G. Display Prompt:

A REPLACEMENT STICKER CANNOT BE ISSUED FROM THIS ANALYZER AT
THIS TIME – PLEASE REFER THE MOTORIST TO THE REFEREE FACILITY OR
THE LOCAL I/M PROGRAM OFFICE.

3. Data Entry for Vehicle Identification

Follow the logic for RRN data entry found at section 3.3-1, II, c. of this Part I.
Upon verification of RRN, the EIS must commence VID initialization and a search
for the last passing I/M test record.

4. Data Entry if no RRN

A. VIN Entry.
Follow the logic for VIN entry found at section 3.3-1, II, d. of this Part I.
Upon entry of the VIN, the EIS must commence the VID initialization and a
search for the last passing I/M test record.

5. Previous test record verification

A. Programming Criteria:

   i.   The EIS must capture the vehicle model year, make, model, RRN, license, original test date, and VIN from the last passing test record found and record the information in Replacement_Insert stored procedure (except license number and original test date) during Replacement Sticker Issuance. The month and year of the sticker expiration date must also be captured, and recorded in Replacement_Insert stored procedure, but not displayed at this time. The EIS must display the vehicle model year, make, model, RRN, license and VIN on the EIS for the I/M mechanic.

   ii. The VID must return a result code of "1," "2" or "3."

      (01) If the result code is "1," proceed to display the prompt for vehicle information match.

      (02) If result code is "2," Display Prompt: LAST PASSING TEST IS OVER TWO YEARS OLD. REFER THE MOTORIST TO THE LOCAL I/M PROGRAM OFFICE OR REQUEST OPPORTUNITY TO CONDUCT INSPECTION TEST.

      (03) If result code is "3," proceed to display prompt for no test match found.

B. Display Prompt:

DOES THIS INFORMATION MATCH THE VEHICLE YOU ARE REQUESTING A REPLACEMENT STICKER FOR? ENTER "Y" FOR YES OR "N" FOR NO.

C. Programming Criteria:

If yes, the EIS must proceed to the display prompt for expiration month and year. If no, the EIS must prompt the I/M mechanic to refer the motorist to the Referee Facility or to the local I/M Program Office.

D. Display Prompt:

NO TEST MATCH IS FOUND, REFER THE MOTORIST TO THE REFEREE FACILITY OR TO THE LOCAL I/M PROGRAM OFFICE.

E. Error Messages:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.
ENTRY IS NOT VALID – TRY AGAIN.

F. Programming Criteria:

The EIS must display the previously issued sticker month and year expiration.

G. Display Prompt:

IS THIS THE SAME EXPIRATION MONTH AND YEAR AS FOUND ON THE REAR LICENSE PLATE OF THE VEHICLE FOR WHICH A REPLACEMENT STICKER IS BEING REQUESTED? ENTER "Y" FOR YES OR "N" FOR NO.

H. Error Messages:

NO VALUE HAS BEEN ENTERED – TRY AGAIN.
ENTRY IS NOT VALID – TRY AGAIN.

I. Programming Criteria:

If yes, the EIS must proceed to "Replacement Sticker Issuance", section 3.5, g,6. of this Part I.

If no, the EIS must prompt the I/M mechanic to refer the motorist to the Referee Facility or to the local I/M Program Office.

6. Replacement Sticker Issuance
The EIS must follow the logic for sticker number verification and issuance found at section 3.3-1, VIII, c. of this Part I. The EIS must follow the logic for print certificate/insert found at section 3.3-1, VIII, d. of this Part I and use "Replacement Copy" of the certificate of inspection as shown in Appendix C, and use original test date in Test Date portion of the certificate of inspection. The EIS must follow the logic for sticker placement found at 3.3-1, VIII, e. of this Part I. The EIS must record the replacement sticker number issued to the Replacement_Insert stored procedure. The replacement sticker number must also be recorded in the Sticker table field "Sticker_Num" and "4" recorded in the Reason_Code field. The replacement sticker number must be printed in the sticker usage report as needed.

3.6 STATE MENU

a. Initiation
When the State Menu is selected from the Main Menu, the operator must be prompted for the state access code.   After three failed attempts to enter a valid state access code, the analyzer must return to the Main Menu.

When the analyzer has accepted the State access code, the analyzer must display the following menu.

STATE MENU

1) STATE ANALYZER MAINTENANCE
2) GAS AUDIT
3) VIEW STATION INFORMATION
4) INSTALL NEW DATA DISK
5) LOCKOUTS
6) PERFORM SOFTWARE UPDATE

1. After an inspector enters a valid menu option number, the analyzer must initiate the associated procedure. If the value entered is not a valid option number, an error message must be displayed to the screen.

b. State Menu: State Analyzer Maintenance Menu
State Analyzer Maintenance Menu must be activated by an entry of "1" from the State Menu. The analyzer must then present a set of maintenance functions that may be performed by the operator. Display Prompt One must be displayed to the screen. The operator must select from the options listed the maintenance function to be performed from Display Prompt One:

STATE ANALYZER MAINTENANCE MENU

1) GAS CALIBRATION AND LEAK CHECK
2) GAS CALIBRATION
3) LEAK CHECK
4) STATUS SCREEN

1. State Analyzer Maintenance: Gas Calibration and Leak Check

A. When the operator selects "1" at Display Prompt One, the analyzer must initiate a gas calibration and leak check sequence.

B. A gas calibration and leak check must be performed every seventy-two hours of operation. ADEC may change the frequency of gas calibrations and leak checks based on statistical analysis of calibration data. Selection of this item must bring up a set of both gas calibration and leak check procedures. The procedures must be user friendly and must indicate each step needed to properly perform the required gas calibration and leak check (including when to turn the gas cylinder valve on or off). Calibration gases are not to be considered expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas is not cause for a gas calibration failure. Gas calibration and leak procedures must be approved by ADEC. Results of the leak check and the gas calibration must be displayed to the screen and recorded on the calibration test record. The system must preclude emissions inspections (Vehicle Emissions Inspection Menu, option "1"), if a gas calibration and leak check are not performed and passed every 72 hours. If the analyzer fails the gas calibration and leak check, a message must be displayed indicating failure, Vehicle Emissions Inspection

Menu, option "1" must then be precluded, and the EIS must assist the inspector in correcting the problem before the inspector is instructed to call for repairs.

C. When the gas calibration and leak check is completed, the analyzer must return to the State Analyzer Maintenance Menu (Display Prompt One).

2. **State Analyzer Maintenance: Gas Calibration**

A. When the operator has selected "2" at Display Prompt One, the analyzer must initiate a gas calibration sequence.

B. Selection of this item must bring up the gas calibration procedures. The procedures must be user-friendly and must indicate each step needed to properly perform the gas calibration (including when to turn the gas cylinder valve on or off). Calibration gases are not to be considered expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas is not cause for a gas calibration failure. Gas calibration procedures must be approved by ADEC. Results of the gas calibration must be displayed to the screen and recorded on the calibration test record. If the analyzer fails the gas calibration, a message must be displayed indicating failure and the EIS must assist the inspector in correcting the problem before the inspector is instructed to call for repairs. The analyzer must not allow any emissions inspections to be performed until the analyzer has successfully completed the gas calibration sequence.

C. When the gas calibration is complete, the analyzer must return to the State Analyzer Maintenance Menu (Display Prompt One).

3. **State Analyzer Maintenance: Leak Check**

A. When the operator selects "3" at Display Prompt One, the analyzer must initiate a leak check sequence.

B. Selection of this item must bring up a set of leak check procedures. The procedures must be user-friendly and must indicate every step needed to properly perform the leak check (including when to turn the gas cylinder valve on or off). Calibration gases are not to be considered expired regardless of the "expiration" date on the bottle. An out-of-date calibration gas is not cause for a gas calibration failure. Leak check procedures must be approved by ADEC. Results of the leak check must be displayed to the screen. If the analyzer fails the leak check, a message must be displayed indicating that it failed and instructing the operator to call for repairs. The analyzer must not allow any emissions inspections to be performed until the analyzer has successfully completed the leak check sequence.

C. When the leak check is complete, the analyzer must return to the State Analyzer Maintenance Menu (Display Prompt One).

4. **State Analyzer Maintenance: Status Screen**

    A. When the operator has selected "4" at Display Prompt One, the analyzer must display the Status Screen. The analyzer must use information stored in the CAL table and other sources to generate the Status Screen.

    B. The structure of the status screen:

        ANALYZER STATUS SCREEN

        STATION NUMBER: XXXXXXXX
        ANALYZER NUMBER: XXXXXXXX
        SPAN GAS CYLINDER #1VALUES:
        PROPANE   XXXX
        CO   XX.XX
        CO_2 XX.X
        O_2 XX.X

        SPAN GAS CYLINDER #2VALUES:
        PROPANE   XXXX
        CO   XX.XX
        CO_2 XX.X
        O_2 XX.X

        DATE AND TIME OF THE LAST GAS CALIBRATION AND LEAK CHECK: MM/DD/YYYY HH:MM:SS.

        NUMBER OF TEST RECORDS STORED ON SYSTEM: XXX (Note: This value is calculated by totaling the number of inspection contained in EIS and EISHST).

        TOTAL NUMBER OF INSPECTIONS SINCE THE LAST DATA TRANSFER: NNNN   (Note: count inspections started since last VID contact and test result transfer.)
        DATE ANALYZER WAS LAST SERVICED: MM/DD/YYYY
        CURRENT DATE AND TIME: MM/DD/YYYY HH:MM:SS
        SOFTWARE VERSION NUMBER: XXXX

    C. After the operator acknowledges the status page, the analyzer must return to the State Analyzer Maintenance Menu.

c. **State Menu: Gas Audit**.

    1. Gas Audit must be initiated when "2" is selected from the State Menu.

    2. The analyzer must prompt the operator to press "1" when ready to begin the Gas Audit.

3. The analyzer must read the values of the gases flowing through the probe.

4. The analyzer must display the values of the audit gas and allow screen-prints to the printer.

5. The software must provide a method of displaying the audit gas values with the Propane Equivalency Factor (PEF) applied or not applied and must indicate if the PEF is being applied to the readings. Alternately, both the hexane and propane values may be displayed at all times.

6. The emission readings must be displayed in large characters, which are easily read by a person with twenty-twenty (20/20) vision from a distance of eight feet.

7. A prompt for use in ending the gas audit must be displayed. When the gas audit is complete, the analyzer must return to the State Menu.

d. State Menu: View Station Information

1. View Station Information sequences must be initiated when "3" is selected from the State Menu.

2. A screen must be displayed that shows all the values in the STATION table.

e. State Menu: Install New Data Disk

1. Install New Data Disk sequence must be initiated when "4" is selected from the State Menu.

2. The analyzer must display on a single screen the instructions for changing the floppy diskette. This procedure must properly format the new diskette and transfer all the files from the old diskette. The instructions must be approved by ADEC.

3. When the change is complete and the analyzer security devices (doors, etc.) are secure, the analyzer must return to the State Menu.

f. State Menu: Lockouts

1. The lockout sequence must be initiated when "6" is selected from the State Menu.

2. The analyzer manufacturer must devise a method to allow the inspection operations to be locked out and still allow all other options to work normally. The analyzer must display a message on the main menu if it is locked out.

3. The analyzer software must allow ADEC to set, or clear, state or tamper lockouts from the VID.

4. The analyzer software must allow ADEC to set or clear, state or tamper lockouts from the EIS.

5. Other "equipment failure" lockouts must be automatically cleared when the equipment is repaired.

6. The lockout screen:

> **CURRENT LOCKOUT STATUS:**
> LOCKOUT TYPE   DATE/TIME   LOCKED OUT
> STATE LOCKOUT   MM/DD/YYYY HH:MM:SS   Set or Clear
> TAMPER LOCKOUT   MM/DD/YYYY HH:MM:SS   Set or Clear

g. State Menu: Software Update
Emergency Software Update must be performed when "7" is selected from the State Menu.

1. When Emergency Software Updates are required between software updates, the manufacturer must develop the update and provide the update to ADEC on a three and one-half inch (3 ½") floppy diskette. ADEC may, in its discretion, install the update itself or have it installed by the manufacturer. If ADEC performs the update, multiple copies may be required.

2. The update process must be made as simple as possible for the operator and include display driven instructions, batch files, etc. ADEC may distribute the update through the modem.

3. Emergency Software Updates must cause the software version number to change.

4. When the update is complete, the analyzer must return to the State Menu and/or reboot.

3.7 MANUFACTURER'S SERVICE MENU
When the Manufacturer's Service Menu is selected from the Main Menu, the operator must be prompted to enter the operator's access code. The manufacturer must provide ADEC with a written description of the technique used to secure this menu option, and this method must be approved by ADEC.

End of section 3.

SECTION 4 - TEST RECORD SPECIFICATIONS

PURPOSE: This section describes the vehicle test record and calibration data file formats for the EIS system. The test record and calibration data must store the vehicle inspection and gas calibration data generated in the operation of the analyzer.

4.1 GENERAL SPECIFICATIONS

a. **The test record must document the vehicle identification and inspection data information gathered during the emissions inspection test**. The test record must also identify aborted test transactions.

b. **This section contains the format of the test record**. The manufacturer must structure the test records exactly as indicated in the tables so that data can be easily analyzed at ADEC. Data entered by the I/M mechanic must be entered through either the keyboard or the bar code scanner.

c. **The calibration data must be stored in a separate table from the vehicle inspection and test data**. The calibration data must be stored in the analyzer system data directory.

d. **Aborted records must be recorded in the EIS and EISHST tables.**

e. **All alphanumeric fields must be left-justified and all numeric fields must be right-justified.**

f. **All date fields must be formatted the four digit year, month and day (YYYYMMDD) to maintain compliance with the century date change**.

g. **CAL, EIS, LOADSTICKER, and LOCKOUT tables must be transmitted from the analyzer system to the VID.**

h. **Analyzers must store the current test record number in the test record**. The field must be six numeric characters in length and field entry must be done by the computer software. The test record number must be a consecutive number from the first vehicle

inspection performed on the analyzer through the maximum number possible before automatic reset. For example, the first test record would be "1," the last test record before reset would be "999999." The analyzer system test record numbers must be stored in a protected file for access only by the analyzer software and shall require controlled access available only to an authorized ADEC representative or manufacturer's technician.

i. **The following tables must be transmitted from the VID to the analyzer system as necessary, in their entirety: DTC, ESC, OBDII_EXEMPTIONS, VRT, LOADSTICKER, LOCKOUT, REGION, STATION and TECH**.

CAL and CALHST

Name	Type	Data Length	Entries
ANALYZER_NUM	STRING	8	
BENCH_SERIAL_NUM	STRING	12	
STATION_NUM	STRING	5	
CAL_SDATE	DATE/TIME		
CAL_EDATE	DATE/TIME		
HC_SPAN_GAS	INTEGER	5	
HC_SPAN_READING	INTEGER	5	
HC_SPAN_RESULTS	STRING	1	P=Pass; F=Fail
HC_MID_GAS	INTEGER	5	
HC_MID_READING	INTEGER	5	
HC_MID_RESULTS	STRING	1	P=Pass; F=Fail
CO_SPAN_GAS	FLOAT	6,2	
CO_SPAN_READING	FLOAT	6,2	
CO_SPAN_RESULTS	STRING	1	P=Pass; F=Fail
CO_MID_GAS	FLOAT	6,2	
CO_MID_READING	FLOAT	6,2	
CO_MID_RESULTS	STRING	1	P=Pass; F=Fail
LEAK_CHECK	STRING	1	P=Pass; F=Fail
CAL_RESULT	STRING	1	P=Pass; F=Fail

DTC

Name	Type	Data Length	Entries
CODE	STRING	5	
DESCR	STRING	40	

EIS AND EISHST

Name	Type	Data Length	Entries
RECORD_NUM	INTEGER	6	
STATION_NUM	STRING	5	
ANALYZER_NUM	STRING	8	
MECHANIC_NUM	STRING	5	
REGION	STRING	5	MOA; FNSB; MATSU
TEST_TYPE	STRING	1	I=Initial; A=After; R=Referee
VID_TEST_TYPE	STRING	1	I=Initial; R=Retest; A=After; N=Not complete
TEST_SDATE	DATE/TIME		
TEST_EDATE	DATE/TIME		
RRN	STRING	8	
RRN_SOURCE	STRING	1	S=Scanned; M=Manual
VIN	STRING	17	
VIN_SOURCE	STRING	1	S=Scanned; M=Manual
VEH_LICENSE	STRING	8	
VEH_LICENSE_SOURCE	STRING	1	S=Scanned; M=Manual
GVWR	INTEGER	5	
MODEL_YEAR	INTEGER	4	
MAKE	STRING	17	
MODEL	STRING	23	
CYL	STRING	2	1-16, R=Rotary
ENGINE_SIZE	INTEGER	4	cc
TRANS_TYPE	STRING	1	A=Automatic; M=Manual
DUAL_EXHAUST	STRING	1	T/F
ODOMETER	INTEGER	7	
FUEL_TYPE	STRING	1	G=Gasoline; B=Bi-fueled (alt. Fuel & gasoline); P=LPG; N=LNG/CNG; M=Methanol (greater then 20%); E=Ethanol (greater then 20%); D=Diesel; L=Electric

BODY_TYPE	INTEGER	1	1=sedan; 2=station wagon; 3=pickup; 4=sport/utility vehicle; 5=minivan; 6=full size van
CERT_TYPE	STRING	1	C=CA; F=Federal; R=Referee Label; N=None; U=Unknown
REFEREE_LABEL	STRING	8	
ESC	STRING	2	
VRT_RECORD_ID	INTEGER	6	(no VRT record=0)
E_TEST_SEQUENCE	INTEGER	1	Emission readings
E_PRECOND_PROCEDURE	INTEGER	1	
E_HIGH_DCF	FLOAT	6,2	
E_HIGH_RPM	INTEGER	5	
E_High_CO2	FLOAT	6,2	
E_HIGH_O2	FLOAT	6,2	
E_HIGH_HC	INTEGER	5	
E_HIGH_HC_DCF	INTEGER	5	
E_HIGH_HC_LIMIT	INTEGER	5	
E_HIGH_CO	FLOAT	6,2	
E_HIGH_CO_DCF	FLOAT	6,2	
E_HIGH_CO_LIMIT	FLOAT	6,2	
E_IDLE_DCF	FLOAT	6,2	
E_IDLE_RPM	INTEGER	5	
E_IDLE_CO2	FLOAT	6,2	
E_IDLE_O2	FLOAT	6,2	
E_IDLE_HC	INTEGER	5	
E_IDLE_HC_DCF	INTEGER	5	
E_IDLE_HC_LIMIT	INTEGER	5	
E_IDLE_CO	FLOAT	6,2	
E_IDLE_CO_DCF	FLOAT	6,2	
E_IDLE_CO_LIMIT	FLOAT	6,2	
E_HIGH_DCF_2	FLOAT	6,2	
E_HIGH_RPM_2	INTEGER	5	
E_HIGH_CO2_2	FLOAT	6,2	
E_HIGH_O2_2	FLOAT	6,2	
E_HIGH_HC_2	INTEGER	5	
E_HIGH_HC_DCF_2	INTEGER	5	
E_HIGH_CO_2	FLOAT	6,2	
E_HIGH_CO_DCF_2	FLOAT	6,2	
E_IDLE_DCF_2	FLOAT	6,2	
E_IDLE_RPM_2	INTEGER	5	
E_IDLE_CO2_2	FLOAT	6,2	
E_IDLE_O2_2	FLOAT	6,2	
E_IDLE_HC_2	INTEGER	5	
E_IDLE_HC_DCF_2	INTEGER	5	

E_IDLE_CO_2	FLOAT	6,2	
E_IDLE_CO_DCF_2	FLOAT	6,2	
E_RESULT	STRING	1	P=Pass; F=Fail
F_ECL	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_MIL	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_VACUUM_LEAKS	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_PCV	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_IAH	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_EFE	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_AIS	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
F_RESULT	STRING	1	P=Pass; F=Fail; N=N/A; O=Override
V_AIS	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_AIR_PUMP	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_AIR_INJECT_PUMP	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_AIR_PUMP_BELT	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_AIR_INJECT_PLUMBING	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_AIR_DIVERTER_VALVE	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override

V_AIR_INJECT_CK_VALVE	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_PULSE_AIR_REED_VALVE	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_CARB	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_FUEL_INJECT	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_PCV	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_MANIFOLDS_IGNITION	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_IAH	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_EFE	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_EVAP	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_OTHER	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_CAT	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override

V_EGR	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_O2_SENSOR	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_VACUUM_HOSES	STRING	1	P=Pass; D=Disconnected; M=Modified; S=Missing; F=Defective; N=N/A; O=Override
V_RESULT	STRING	1	P=Pass; F=Fail; O=Override
KOEO_RESULT	STRING	1	P=Pass; F=Fail; O=Override
KOER_RESULT	STRING	1	P=Pass, F=Fail; O=Override
OBD_RDY_MISFIRE	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_FUEL	INTEGER	1	0=VID-enabled; not supported/enabled 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.

OBD_RDY_COMPONENT	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_CAT	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_CAT_HEATED	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_EVAP	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.

OBD_RDY_SEC_AIR	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_AIR_COND	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_O2_SENSOR	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_O2_HEATER	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.

OBD_RDY_EGR	INTEGER	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_RDY_RESULT	STRING	1	0=VID-enabled; not supported/enabled; 1=VID-enabled; completed; 2=VID-enabled; not completed; 3=VID-disabled; not supported/enabled; 4=VID-disabled; completed; 5=VID-disabled; not completed.
OBD_PID	STRING	3	
OBD_PCM ID	STRING	3	
OBD_VIN	STRING	17	
OBD_FLT_CODES	STRING	50	Variable length list of fault codes, comma delimited
OBD_FLT_RESULT	STRING	1	P=Pass; F=Fail
OBD_MIL_STATUS	INTEGER	1	0=On; 1=Off
OBD_RESULT	STRING	1	P=Pass; F=Fail; C=Inaccessible connector; N=No response to Mode $01, PID $01, A=Forced abort for previous readiness codes check 0=On; 1=Off
ONLINE_STATUS	INTEGER	1	0=Online; 1=Offline
OFFLINE_REASON_CODE	NUMBERINT EGERNUMBE RINTEGER	5	Per data communications spec
ABORT_CODE	STRING	2	(see definitions below)
PREVIOUS_STICKER_NUM	STRING	9	
NEW_STICKER_NUM	STRING	9	
SOFTWARE_VERSION	STRING	4	
OVERALL_RESULT	STRING	1	P=Pass; F=Fail; A=Abort; O=Override
R_TOTAL_COST	INTEGER	5	

R_EGR	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_ELECTRICAL	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_EVAP_CONTROL	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_EXHAUST	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_IGNITION	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_INTAKE	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_ENGINE	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_PCV	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
R_OTHER	STRING	1	Y=Repaired; W=Manufacturer Warranty; O=Referee Override
REG_EXPIRE_DATE	DATE		

ABORT_CODE definitions: 01=Oil System Leak Or Warning Light On
02=Transmission Leak
03=Coolant System Leak Or Warning Light On
04=Fuel System Leak
05=Excessive Exhaust System Leak
06=Exhaust Inaccessible
07=Sample Dilution
08=Engine Rpm Too High
09=Engine Rpm Too Low
10=Excessive Engine Noise
11=Maintenance Warning Light On
12=Safety Problems On Vehicle
13=Vehicle Does Not Require Inspection
14=BMW/Peugeot/Volvo Automatic Transmission
15=Referee Referral
20=Other (Indicate Reason On The VIR)

ESC

Name	Type	Data Length	Entries
VEHICLE_TYPE	STRING	1	P=Passenger; T=Truck
MIN_MODEL_YR	INTEGER	4	
MAX_MODEL_YR	INTEGER	4	
MIN_GVWR	INTEGER	5	
MAX_GVWR	INTEGER	5	
MIN_CYL	INTEGER	2	
MAX_CYL	INTEGER	2	
ESC	INTEGER	2	
HC_IDLE	INTEGER	5	
CO_IDLE	FLOAT	6,2	
HC_2500	INTEGER	5	
CO_2500	FLOAT	6,2	
MIN_COCO2	FLOAT	6,2	
MAX_IDLE_RPM	INTEGER	5	

LOADSTICKER

Name	Type	Data Length	Entries
MECHANIC_NUM	STRING	5	
LOAD_DATE	DATE/TIME		
START_NUM	STRING	9	
END_NUM	STRING	9	

LOCKOUT

Name	Type	Data Length	Entries
STATE_STATUS	STRING	1	S=Set; C=Clear
STATE_POST_DATE	DATE/TIME		
TAMPER_STATUS	STRING	1	S=Set; C=Clear
TAMPER_POST_DATE	DATE/TIME		

All lockout transactions performed at the EIS must be recorded in this table.

MAIL_MESSAGES

Name	Type	Data Length	Entries
MAIL_MSG	STRING	4000	
POST_DATE	DATE/TIME		

This table may be used to store both read and unread mail messages for offline viewing.

OBD_EXEMPTIONS

Name	Type	Data Length	Entries
MODEL_YEAR	INTEGER	4	
MAKE	STRING	20	
MODEL	STRING	25	
TEST	STRING	1	T/F; T = Conduct OBD Test; F = Do not conduct OBD Test
VIR_MSG	STRING	512	
OBD_RDY_MISFIRE	STRING	1	T/F
OBD_RDY_FUEL	STRING	1	T/F
OBD_RDY_COMPONENT	STRING	1	T/F
OBD_RDY_CAT	STRING	1	T/F
OBD_RDY_CAT_HEATED	STRING	1	T/F
OBD_RDY_EVAP	STRING	1	T/F
OBD_RDY_SEC_AIR	STRING	1	T/F
OBD_RDY_AIR_COND	STRING	1	T/F
OBD_RDY_O2_SENSOR	STRING	1	T/F
OBD_RDY_O2_HEATER	STRING	1	T/F
OBD_RDY_EGR	STRING	1	T/F

REGION

Name	Type	Data Length	Entries
CAL_FREQ	INTEGER	3	Hours
HC_HANGUP_LIMIT	INTEGER	2	PPM Propane
PRECOND_TIME	INTEGER	3	Seconds
OBD_MODEL_YR	INTEGER	4	
OBD_MODEL_YR_RETEST	INTEGER	4	
OBD_FAIL_START_DATE	DATE		
NO_CERT_PRINT_DATE	DATE		
FIRST_MYR_TEST	INTEGER	4	
FIRST_MYR_FUNCTIONAL	INTEGER	4	
FIRST_MYR_VISUAL	INTEGER	4	
VISUAL_FUNC_TEST	STRING	1	T/F
WIRELESS_PROMPT	STRING	1	T/F
MY_READY	INTEGER	4	
READY_UNSET_1	INTEGER	2	
READY_UNSET_2	INTEGER	2	
READY_AFTER_REPAIR_1	INTEGER	2	
READY_AFTER_REPAIR_2	INTEGER	2	
OBD_RDY_MISFIRE	STRING	1	T/F
OBD_RDY_FUEL	STRING	1	T/F
OBD_RDY_COMPONENT	STRING	1	T/F
OBD_RDY_CAT	STRING	1	T/F
OBD_RDY_CAT_HEATED	STRING	1	T/F
OBD_RDY_EVAP	STRING	1	T/F
OBD_RDY_SEC_AIR	STRING	1	T/F
OBD_RDY_AIR_COND	STRING	1	T/F
OBD_RDY_O2_SENSOR	STRING	1	T/F
OBD_RDY_O2_HEATER	STRING	1	T/F
OBD_RDY_EGR	STRING	1	T/F

STATION

Name	Type	Data Length	Entries
NAME	STRING	35	
STREET	STRING	35	
CITY	STRING	25	
STATE	STRING	2	
ZIP	STRING	10	
PHONE_NUM	STRING	12	999-999-9999
ALLOW_MANUAL_CERT_ LOAD	STRING	1	T/F
ALLOW_REPLACEMENTS	STRING	1	T/F
LOCKOUT_DAYS	INTEGER	3	
LOCKOUT_TESTS	INTEGER	3	
CERTIFICATE_STATUS	STRING	1	C=Certified; D=Decertified (no testing permitted); E=Expired (no testing permitted); S=Suspended (no testing permitted)

STICKER

Name	Type	Data Length	Entries
STATION_NUM	STRING	5	
MECHANIC_NUM	STRING	5	
STICKER_NUM	STRING	9	
REASON_CODE	INTEGER	1	1 – Emissions Inspection; 2 – Damaged / Voided; 3 - Lost/Stolen; 4 – Replacement
DATE	DATE/TIME		

TECH

Name	Type	Data Length	Format	Entries
MECHANIC_NUM	STRING	5		
LAST_NAME	STRING	25		
FIRST_NAME	STRING	20		
MIDDLE_INIT	STRING	1		
ACCESS_CODE	STRING	5		
CERTIFICATE_STATUS	STRING	1		C=Certified; D=Decertified (no testing permitted); E=Expired (no testing permitted); S=Suspended (no testing permitted)
LICENSE_TYPE	STRING	1		R=Referee; A=Mech w/alternate fuel; M=Mech w/o alternate fuel

VRT

Name	Type	Data Length	Entries
RECORD_ID	INTEGER	6	
GVWR	INTEGER	5	
MODEL_YEAR	INTEGER	4	
MAKE	STRING	17	
MODEL	STRING	23	
CYL	STRING	2	1-16, R=Rotary
ENGINE_SIZE	INTEGER	4	cc
TRANS_TYPE	STRING	1	A=Automatic; M=Manual; E=Either
BODY_TYPE	INTEGER	1	1=sedan, 2=station wagon, 3=pickup, 4=sport/utility vehicle, 5=minivan, 6=full size van
OBD_LOCATION	INTEGER	1	1-9
OBD_COVERED	STRING	1	T/F
OBD_COMMENT	STRING	25	

*SECTION 5 – VEHICLE INSPECTION REPORT AND PRINTER FUNCTION
SPECIFICATIONS*

*PURPOSE: This section describes the vehicle inspection report and printer functions for the
Alaska2000 Emissions Analyzer System.*

5.1 VEHICLE INSPECTION REPORT (VIR)

    **a. The completed vehicle inspection report must be modeled after the sample VIRs
described in this section and in Appendix D below. Final layout is subject to
approval by ADEC.**

    **b. The completed report must be on eight and one-half by eleven inch (8 ½" x 11")
paper.**

    **c. The appropriate report must be automatically printed by the EIS at the conclusion
of each emissions inspection, regardless of the inspection results. The EIS must not
use pre-printed forms.**

    d. Report Field Format.

        1. The date and time recorded on the VIR shall be the date and time of the start time of
the inspection as stored in the record.

        2. The test result (PASS, FAIL or ABORTED/INVALID) must be printed in capital
letters.

    **e. The station number and vehicle information must be retrieved from the test record.
The vehicle model must be spelled out completely up to the maximum number of
characters available.**

    **f. The emissions inspection summary must list all emissions inspection results and
emissions inspection standards except for aborted or training tests.**

    **g. Each report page must include a line for the I/M mechanic's signature with the
mechanic's name printed below the line.**

5.2 PRINTER FUNCTIONS AND SPECIFICATIONS

The EIS must be equipped with a laser printer to print vehicle inspection reports. This printer must accept eight and one-half by eleven inch (8 ½" x 11"), 20 lb. bond paper. The printer must print the VIR as shown in Appendix D. The technical specifications for this printer are contained in Section 6.

5.3 BAR CODES

a. **The VIN must be printed as the top bar code with a leading and trailing identifier of "*." As an example, a VIN of 2FTEF14N9FCB47189 would be coded as *2FTEF14N9FCB47189*.**

b. **The RRN Number must be printed below the VIN bar code (with appropriate white space).**

c. **The RRN Number must be printed with a leading and trailing identifier of "*." As an example, an RRN of 12345678 would be coded as: *12345678*.**

d. **Human-readable, alpha-numeric characters must be printed immediately below each of the bar codes, except as noted on the VIRs, and the leading and trailing "*" identifier characters must not be printed as part of the human-readable string.**

e. **Refer to Appendix A for detailed bar code specifications.**

END OF SECTION 5

SECTION 6 - TECHNICAL SPECIFICATIONS FOR THE ANALYZER SYSTEM

PURPOSE: This section describes the technical specifications for the EIS. The technical specifications include the maintenance functions to be performed by the analyzers, the operating conditions and hardware.

6.1 OVERVIEW

a. **Section 6 discusses the hardware performance requirements (and design requirements, where necessary) for the Emissions Inspection System (EIS) necessary for emissions testing**

b. **This section covers the computer and its peripherals, the emissions analytical train and its sample conditioning system, the cabinet and the hardware aspects of its security, bar code scanning, engine speed measurement and other equipment.**

c. **The EIS comprises an IBM-compatible personal computer (PC) with a printer, modem, and software to perform two-speed idle emissions testing; a four-gas analyzer and sample conditioning system; calibration gases; and a cabinet.**

6.2 ACCEPTANCE AND CERTIFICATION

a. **BAR97 equivalency**
Analyzer certification for Alaska2000 must be either BAR97-certified or its equivalent. If a manufacturer intends to provide BAR97 equivalent equipment for certification, the manufacturer must show how it will demonstrate equivalency for acceptance before building and programming its Alaska2000 system.

b. **Acceptance**

1. Two complete analyzer units, including all microcomputer equipment and software, must be submitted to ADEC for certification and testing prior to offering the system for sale to the public.

2. All equipment and software submitted for certification must be the full and current configuration proposed for sale. PARTIAL, DATED OR INCOMPLETE MODELS WILL NOT BE ACCEPTED.

3. Acceptance of the microcomputer portion of the analyzer system by ADEC is dependent upon the manufacturer's full conformity with the requirements of this specification.

4. The manufacturer must pay for all shipping and equipment preparation charges incidental to approval testing.

6.3 MINIMUM REQUIRED CONFIGURATION

a. **Operating System**
Each unit must be delivered with the latest version of MS-DOS, Microsoft Windows, or IBM OS/2. The operating system must support communication via TCP/IP.

b. **Processor / Co-Processor**
The microprocessor must be an Intel Pentium class processor or equivalent. The minimum speed of the processor must be 100 MHZ. Replacement microprocessors must be the same brand as the original EIS microprocessor.

c. **Memory**
Each unit must be equipped with a minimum of 8 MB of RAM memory expandable to at least 64 MB. If running Microsoft Windows, the analyzer must have a minimum of 16 MB RAM.

d. **BIOS**
Each unit must include a BIOS which provides a self-diagnostic routine to check the critical components upon power up and which supports the installed operating system, all supplied components and all standard PC components.

e. **Bus**
Each unit must have either a PCI or ISA bus.

f. **Monitor**

1. The display monitor must be a minimum of 15 inches measured diagonally, supporting VGA color with a minimum resolution of 640 x 480 and a maximum dot pitch of 0.28 dots per inch. The minimum size of the active viewing area must be fourteen (14) inches^2. The display must be driven by a graphics adapter fully compatible with the IBM VGA color graphics adapter. The monitor must be

user-replaceable without requiring access to secured areas of the analyzer. The monitor must not be proprietary.

2. The software must blank the screen if no keyboard entry is made within a 20-minute period to minimize image burning. After the screen has blanked, the software must display a moving message to indicate that the system is still functional. The display image must return after the operator strikes any key. The moving message to be displayed must be set by ADEC. This message must not be changed once specified by ADEC, except as part of a software update.

g. **Floppy Disk**
Each analyzer must be equipped with a standard 1.44 Mb, 3.5 inch, IBM compatible floppy disk drive accessible only to ADEC authorized representatives. The analyzer must be capable of reliably reading, writing and formatting high density, 3.5 inch diskettes in MS-DOS format. The secured floppy disk drive must be designated as drive "A." Each analyzer may also be equipped with another standard 1.44 Mb, 3.5 inch, IBM compatible floppy disk drive. The drive is to be available to the operator installing additional software packages on the system and must be fully compatible with the IBM PC and capable of reading, writing or formatting high density diskettes. This second drive must be installed in a manner that will ensure the security of the CPU and hard disk. This drive may be provided as an option to the purchaser.

h. **Hard Disks**

1. Each analyzer must be equipped with, at a minimum, 1 GB hard disk drive. This drive must only be used to store the operating system, programs, and data related to I/M testing.

2. Each analyzer may also be equipped with a second hard disk drive. This second drive would be provided as an option and may be used for supplemental vendor software.

i. **Hard Disk Controller**
Each analyzer must be equipped with either a standard SCSI Controller and/or a standard EIDE Controller.

j. **I / O Ports**
The analyzer must include at least one (1) IBM PC standard compatible parallel printer port and two (2) UART 16550-equipped IBM PC compatible serial ports. At least one unused serial port must be available. All the ports must be clearly labeled and user-accessible.

k. Keyboard

The analyzer must be equipped with a standard IBM PC-AT or compatible 101 key keyboard or a Windows 95 104 key keyboard is also acceptable. The keyboard must be user-replaceable without requiring access to secured areas of the analytical system. The keyboard must not be proprietary.

l. Modem

The analyzer must be equipped to transfer vehicle test records to the VID via a secure modem connected to a dedicated telephone line installed at the facility.

    A. A telephone line, separated from the power cord, must be provided for the modem. The telephone line must be in a protective cable with UL or ETL approval.

    B. The modem must have a minimum baud rate of 33.6Kbps and must support the following protocols:

        i   Modulation: ITU V.32, V.32bis, V.34;

        ii   Error Control: ITU V.42, MNP 3,4,5;

        iii   Compression: ITU V.42bis, MNP5; and

        iv   must support the industry standard "AT" command set.

    C. The manufacturer must ensure that the modem is working properly when the analyzer is powered up.

    D. The modem must be upgradable.

m. Expansion

    1. The EIS PC must have at least one secured, externally accessible bay available for devices such as a CD-ROM.

    2. At least one PCI and one ISA expansion slot must be available in the analyzer unit after the manufacturer has installed all features and adapters required to meet the current specification. These slots cannot be used by the manufacturer for additional options unless approved by ADEC.

    n. **Printer**

        1. Each analyzer must be equipped with a single laser printer. The printer must be user-replaceable without requiring access to secured areas of the analyzer. The printer must not be proprietary and must operate reliably in a shop environment.

        2. The laser printer must, at a minimum, meet the following requirements:

            A. print speed: 4 pages per minute;

            B. resolution: 300 dpi;

            C. memory: 1 Mb standard with the capability to support 2 Mb;

            D. paper handling: 50 sheet input, with a single tray that supports letter size paper and 25 sheet output; and

            E. interface: high-speed parallel.

        3. The laser printer must print the VIR in the format shown in Appendix D.

        4. The printer must print VIR bar codes that can be reliably read by standard bar code scanners.

        5. The printer may also be used for general-purpose printing.

6.4 CALIBRATION GASES

    a. **The EIS must utilize BAR97 gases and zero air for zeroing**.

    b. **Gases must have a +/- 2% blend tolerance and an overall accuracy of +/- 1%.**

                             Low Concentration Gas
                             HC   200ppm
                             CO   0.50%
                             CO_2 6%

                             High Concentration Gas
                             HC   3200ppm
                             CO   8.0%
                             CO_2 12%

        Alternative gas concentrations must meet with ADEC approval.

c. **No more than 2 liters of each gas must be used by the EIS to successfully perform a gas calibration; exceptions are subject to ADEC approval**.

The analyzer must be designed to accommodate the gas cylinders necessary to perform the gas calibration. The analyzer must be equipped with a gas calibration port. The gas cylinder mounting must provide adequate room for routine access, servicing and replacement of cylinders, regulators, etc. The brackets and other hardware must be located so that analyzer stability and impact protection is considered in the design. The gas cylinder storage area must be actively ventilated to prevent gas buildup in case of leakage.

The analyzer manufacturer must design the connectors used with the gas cylinders so that cylinders containing different concentrations or compositions of gas cannot be switched. As an alternative, the manufacturer may use the same connectors on all required cylinders if a message is displayed instructing the operator to properly connect the hoses to the gas calibration cylinders when they are not connected correctly. In addition, for this alternative, some type of reasonably permanent, prominent label or tag must be used to readily identify which hose must be attached to which cylinder. Other alternatives may be presented to ADEC for consideration. In any event, disposable cylinders must be equipped with CGA 165 connectors.

Separate regulators must be used for each cylinder necessary to perform a gas calibration. Regulator materials must be compatible with the gases of interest.

6.5 DOCUMENTATION TO BE PROVIDED ONLY TO ADEC

a. **Software**
The manufacturer must provide ADEC with full, user-friendly documentation of the design and source code of any proprietary software used in the Alaska2000 system. The documentation must fully describe the specification and functioning of the Alaska2000 system software and be designed to allow ADEC to understand the operation and structure of the software code.

b. **Hardware Manuals**
The vendor must provide complete technical manuals covering installation and operation of the microcomputer hardware. All technical manuals must be commercially printed and must show title, manufacturer's name and address, and copyright date and include the version or release number.

c. Files/tables

All data files and tables on the analyzer must include a full record layout. This layout

must identify file name, security and each field within the file. For each field, the delimiters, contents, definition and editing rules are to be provided in the form of a data dictionary.

End of Section 6.

*SECTION 7 - DOCUMENTATION, LOGISTICS, AND WARRANTY
REQUIREMENTS*

*PURPOSE: This section describes the documentation, logistics, and warranty
requirements for the emissions analyzer specification.*

7. 1 GENERAL

Upon delivery of the EIS to inspection stations, the manufacturer must provide any special
adjustment as needed to calibrate the EIS. Also, the following items must be included with
each EIS submitted for approval or delivered to inspection stations:

a. **an instruction manual, securely held in a binder (or other suitable container) made
    of a material that is resistant to most petroleum-based products used in the garage
    environment;**

b. **a copy of the warranty required at 7.3 of this Part I and any annual service
    agreement;**

c. **a copy of the disclosure statement required at 7.4 of this Part I;**

d. **four sets of filters and one set of gas cylinders (as required for calibration); and**

e. **an attached placard denoting operating procedures, gas checking/calibrating steps,
    maintenance items and local service contact with phone number and address.**

7. 2 INSTRUCTION MANUAL

The instruction manual accompanying each analyzer must contain at a minimum the
following information:

a. **Background information describing how vehicle emissions are formed during the
    combustion process, the general types of controls that are used on vehicles and what
    negative health impacts can result from vehicle emissions.**

b. **Functional diagrams (mechanical & electrical).**

c. **Accessories and options (included and/or available).**

d. **Model number and identification markings and locations.**

e. **Maintenance procedures and frequencies recommended by the manufacturer (the services that should be performed only by the manufacturer must be clearly identified).**

f. **Gas calibration/leak check procedures as well as calibration procedures for internal/integral device.**

g. **Brief description of the inspection/test procedures with a subject index.**

h. **Brief description of emissions analyzer operating principles.**

i. **A listing and an easily understood explanation of warranty provisions (including the extended warranty), signed by a company representative and the purchaser.** Information provided must include a listing of warranty repair stations by name, address, and phone number.

j. **Name, address, and phone number of the manufacturer's representative in charge of sales and service personnel for the company in Alaska**. In addition, information must be provided indicating the name, address and phone number for the company's vice president of service (or equivalent) who reports directly to the chief executive officer. The names of these representatives must be verified, or updated as needed, every time a service technician visits a station.

7.3 EIS WARRANTY

a. **Scope of Warranty**.

    1. The cost of the analyzer must include a one-year transferable warranty covering parts and labor. An optional extension to this warranty for up to 4 additional years (in one-

year increments) must be made available to all purchasers. The warranty must cover all items that are a part of the analyzer system as described in this specification. The manufacturer must provide instructions to the purchaser describing the procedures needed to repair, replace or adjust components which are not covered by the warranty and which may be accessed without compromising the security of the analyzer. The manufacturer must provide the purchaser with the information necessary to properly select replacement parts not covered by the warranty to prevent degradation of analyzer performance. In addition, an adequate number of qualified repair technicians must be retained by the manufacturer to perform repairs on analyzers in a timely manner.

2. Preventive maintenance contracts are not required by ADEC. The manufacturer may include preventive maintenance in the price of the analyzer. The terms and conditions of the warranty must not be contingent upon the purchase of any additional warranties or entering into a service agreement or maintenance agreement.

3. The initial EIS software must be covered by at least a 6-month warranty after full program implementation.

4. All EIS upgrades or software updates must be covered by at least a 6-month warranty after full program implementation of an update.

b. **Warranty Provisions**
    Warranty provisions protecting the interest of the buyer must include:

1. Location, phone numbers and addresses of the repair centers throughout the State of Alaska. These must be of an adequate number and so located to efficiently and timely meet program area service needs. All response time and cost provisions must be clearly indicated in the warranty provisions. The manufacturer must clearly stipulate not only response time to diagnose problems, but also maximum time to repair or replace parts (i.e., maximum permissible analyzer system downtime).

2. Name of the manufacturer's representative closest to each franchised service center (if not a factory service center).

3. Coverage of all of the Inspection/Maintenance (I/M) hardware and including user replaceable components. The warranty must cover all new components as well as those replaced by the manufacturer's service representative, but not components replaced by the user. A description of specific parts and labor covered by the provisions of the warranty must be permanently provided to the purchaser. In addition, the warranty must itemize the parts and labor that are not covered by the warranty. To ensure that purchasers are properly notified regarding the cost and provisions of the warranty, the EIS must not be delivered until a copy of the warranty has been signed by the purchaser and a company representative. Service response time and loaner provisions must be initialed by the purchaser. A copy of the signed

warranty must be provided to the purchaser and a copy filed with the I/M Office of ADEC.

4. The analyzer owner must be provided a cost estimate prior to the performance of any service or maintenance, unless the work will be covered by the warranty. Regardless of whether or not the work is covered by the warranty, the owner must be provided a detailed description of the work performed when the job is completed. In addition to the description of the work performed, the owner must be provided a toll free telephone number to call to address complaints about the work performed, the courtesy or competency of the manufacturer's technician or any other aspect of the warranty.

5. Manufacturers must provide stations with loaner instruments if they are unable to repair analyzers within the specified time indicated in the warranty. Loaner instruments must be gas calibrated and provided with new filters, printers must be full of paper and the latest version of I/M testing software must be installed. The analyzer manufacturer must notify the local I/M program office immediately if a loaner analyzer is placed in a station. Care must be taken by the technician to maintain the sequence of the reports and to keep them in good condition.

6. The software warranty must cover corrective programming related to correction of bugs, omitted features and misinterpretation of the analyzer specification. All software updates must be approved by ADEC.

7.4   DISCLOSURE STATEMENT

a. **The manufacturer must provide a disclosure statement, which is subject to ADEC approval, to a purchaser of an Alaska2000 EIS prior to consummation of the sale.** At a minimum, the statement must address the following matters and be signed by the purchaser who must also initial each item to acknowledge the disclosure.

1. The cost of installing any ADEC-required software update (after the initial update identified in 1.3.t. of this Part I) is the responsibility of the EIS owner.

2. The certification issued by ADEC indicates that the test system meets the requirements of the Alaska2000 EIS specifications and is therefore authorized to perform required I/M inspections on vehicles. The certification does not make ADEC liable or responsible for any damage caused by the EIS.

3. The cost of the analyzer includes a one-year transferable warranty covering parts and labor. An optional extension to this warranty for up to 4 additional years (in one-year increments) must be available.

4. Any change to the warranty or service contract must be approved by ADEC.

b. If the manufacturer fails to provide the purchaser with a warranty and warranty description and the purchaser files a written complaint with ADEC, the manufacturer must refund to the purchaser the depreciated value of the EIS based on straight line depreciation over 5 years.

7.5 REPLACEMENT PARTS

The manufacturer must maintain an adequate supply of replacement parts and accessories to fulfill the service requirements of the instrument warranty/extended warranty. Replacement components for approved analyzers must be approved by the manufacturer. All analyzer components must function properly before conducting an official emissions inspections.

7.6 WORKMANSHIP

Each manufacturer or the manufacturer's agent must guarantee the repairs made for a period of ninety (90) days.

7.7 PARTS REMOVED

All parts removed by the manufacturer's service representative from the analyzer system to accomplish repairs must be accounted for and given to the instrument owner when the instrument is returned to service except for parts covered under warranty. Parts which can be rebuilt and returned to service must be listed on the completed work order and must be covered under the ninety (90) day workmanship guarantee.

7.8 NONCOMPLIANCE WITH ANY PORTION OF THE EIS SPECIFICATIONS

a. An analyzer system certification may be revoked, or may be conditionally revoked, if ADEC determines that the analyzer does not fully comply with all portions of the analyzer specifications or that either of the following conditions exist:

1. software updates are not performed within the time period specified by ADEC or do not meet the requirements specified by ADEC; or

2. analyzers in the field are found to be in violation of the analyzer system specifications and the manufacturer refuses to resolve the matter either in the time period requested by ADEC or in a way that is satisfactory to ADEC.

b. Revocation of a manufacturer's certification may, in the discretion of ADEC, be limited to future sales of analyzers. Existing analyzers which do not conform to analyzer and update specifications will be locked out until they are brought into compliance. If problems identified are not corrected within the time specified by ADEC, a certification may be permanently revoked. If a certification is conditionally or permanently revoked, ADEC will notify all licensed stations and representatives of the repair industry that new stations purchasing the affected analyzers will no longer be certified by ADEC.

End of Section 7.

PART II

MECHANIC TRAINING COURSE REQUIREMENTS

PART II. MECHANIC TRAINING COURSE REQUIREMENTS

PURPOSE: Training courses required for mechanic certification must be approved under 18 AAC 52.410. This Part describes the minimum course content for an approval program.

* * * * *

a.   Basic Material: The basic material to be covered in the mechanic training course is described in (d) of this Part II. As far as curriculum details are concerned, the federal course on emissions systems diagnosis, with certain supplementary material, is acceptable. This course was developed by and is available from the National Center for Vehicle Emissions Control and Safety, Department of Industrial Sciences, Colorado State University (CSU). The DEC I/M Program Administrator will, in his or her discretion, approve alternative curricula.

b.   Required Supplements: The required supplements to the basic CSU course are

   1.   Chokes: Mechanics must be instructed in the proper cleaning and adjustment of the choke mechanism, checking for binding, and for proper connection of choke heaters.

   2.   1981 and newer models: The non-adjustability of carburetors must be explained. The basic operation of closed-loop systems, including the microprocessor, the role of the exhaust oxygen sensor and other sensors, the operation of three-way catalysts and the need for precise control of air-fuel ratio, must be explained.

   3.   1996 and newer model year vehicles: On-Board Diagnostics, phase II (OBDII) components, strategies of operation and proper repair procedures.

c.   Instructor Qualifications: Instructors for the mechanic training course must have completed the CSU course described in (a) of this Part, including the new Unit VII on computer-controlled engines, or an equivalent training program approved by ADEC's Program Administrator. Instructors must be approved by ADEC's I/M Program Administrator.

d.   Material to be Covered: Material to be covered in the mechanic training course must include:

   1.   The role of motor vehicles as sources of air pollution, particularly the problem of cold weather vehicle operation causing high carbon monoxide (CO) emissions.

   2.   The combustion processes that occur in an engine to form hydrocarbon (HC), CO, and nitrogen oxide (NO) emissions.

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3. The responsibilities of vehicle manufacturers, the service industry, and individual mechanics in the areas of federal exhaust emission standards, emission control system warranties and tampering.

4. The function and effect on exhaust emissions of all motor vehicle emission control systems, including

    A. the positive crankcase ventilation (PCV) system;

    B. the exhaust gas recirculation (EGR) system;

    C. the air injection systems;

    D. the catalytic converter;

    E. the thermostatic air cleaner (TAC);

    F. the early fuel evaporation (EFE) system; and

    G. the evaporative emission control system.

5. The use of infrared (IR) exhaust gas analyzers in the diagnosis and repair of vehicles.

6. The symptoms and causes of excessive HC emissions, and their diagnosis and correction, including

    A. ignition system malfunctions;

    B. the effects of ignition system malfunctions;

    C. the effects of ignition timing advance and retard;

    D. the effects of intake air leaks and their detection;

    E. causes and symptoms of lean misfire;

    F. EGR system malfunction;

    G. engine wear; and

    H. mechanical problems.

7. The symptoms and causes of excessive CO emissions, and their diagnosis and correction, including

    A. plugged air filters;

    B. improper choke operation;

    C. malfunctioning heater-air intake systems;

    D. PCV system malfunction (plugged PCV or fuel-diluted engine oil);

    E. improper carburetor adjustments (idle speed, idle air-fuel mixture); and

    F. internal carburetor malfunctions.

8. The diagnosis and correction of concurrent excessive HC and CO emissions.

9. The proper carburetor adjustment procedures, including the correct procedures for determining whether carburetor adjustment is needed; steps to be taken before adjusting carburetor idle mixture or idle speed include

    A. warming the engine to normal operating temperature;

    B. eliminating ignition system malfunctions;

    C. verifying proper ignition timing, dwell, and advance system operation;

    D. replacing the air filter if necessary;

    E. verifying the transmission is in the proper position per the manufacturer's specifications; and

    F. verifying that all vacuum hoses are properly connected according to the manufacturer's specifications.

10. The proper adjustment and the cleaning of choke mechanisms.

11. The fuel control and catalytic converter systems on 1981 and newer model-year vehicles, including three-way catalysts and exhaust oxygen sensors in closed-loop fuel control systems.

12. The on-Board Diagnostics, phase II (OBDII) systems for 1996 and newer model year vehicles, components, strategies of operation and proper repair procedures.

13. The statutes, regulations, and other procedures governing the maintenance and repair of emission control systems on motor vehicles in Alaska, with an emphasis on I/M program requirements in 18 AAC 52 and other applicable federal, state, and local statutes and regulations.

e. Instruction Requirements: For students who do not pass a screening test for competency in emission control system maintenance and repair, the training course must require about 40 hours to cover all subjects, with time divided between lectures and demonstration exercises and hands-on learning. Time must be allocated approximately as follows:

Subject	Lecture Hours	Demonstration and Hands-on Hours
Vehicle emissions, health effects, and the I/M program	2.0	
Four gas analysis	2.0	1.0
Ignition systems, HC and NOx control	0.75	
DIS/COP/CNP ignition systems	1.0	1.0
Carburetion and Carburetors	3.0	
Mechanical emission control devices	0.5	
PCV and evaporative control systems	1.0	1.0
Thermostatic air cleaners	0.75	1.0
Exhaust gas recirculation	1.0	1.0
Air injection systems	0.75	1.5
Catalytic converters	1.25	1.0
Electrical theory basics/meter usage	2.0	1.0
Computerized engine controls/OBD	2.0	2.75
Fuel injection	2.75	1.5
Latest technologies	0.50	
Review and independent study	4.0	
Test	2.0	
TOTAL	**27.25 hours**	**12.75 hours**

Portions of the test required under **f.** of this Part II, below, that are not related to the specific details of the I/M program, may be given as a screening test for competency in the area of emission control system maintenance and repair. Passing the screening test qualifies a mechanic for an abbreviated course that concentrates on the details of the I/M program requirements and procedures rather than on basic emission control system theory, maintenance, and repair. To pass the abbreviated course, the same demonstration of hands-on proficiency is required as described for the longer course at **f.** of this Part II, below.

f.   Testing Requirements: The minimum requirements for hands-on proficiency to pass the mechanic training course are:

1.   The student must demonstrate a proficiency in setting up, calibrating, and using an IR exhaust gas analyzer to get a representative reading from a vehicle's exhaust system and perform an OBDII test.

2.   Using an IR analyzer and engine diagnosis system, the student must demonstrate an understanding of the effect on HC emissions of ignition system malfunction and ignition timing.

3.   The student must demonstrate an understanding of lean misfire as a cause of HC emissions and methods of detecting manifold air leaks, malfunctioning (open at idle) EGR systems and malfunctioning PCV valves.

4.   The student must demonstrate an understanding of the effect on CO emissions of increasing idle speed, removing an air cleaner cover, closing the choke plate and an improper air-fuel mixture.

5.   The student must properly adjust the idle air-fuel mixture of a vehicle initially maladjusted to an idle CO level well in excess of the applicable I/M program standards.

6.   The student must follow the course-taught steps to solve a problem of excessive HC and CO. Specially bugged vehicles must be used to simulate problems such as misfire, improper ignition timing, restricted air intake and improper air-fuel mixture.

7.   Each student must be given a comprehensive written test covering all elements of the training course. The minimum passing score is 80%, which should reflect the level of knowledge expected of a well-qualified mechanic in the area of emission control system maintenance and repair. In addition, to pass the test, each student must demonstrate a detailed knowledge of Alaska I/M program requirements, procedures and cost minimums.

g.   Facility and Equipment Requirements: The facility and equipment requirements for the mechanic training course are:

1.   Meeting room equipped with student desks, chalkboard or equivalent, overhead transparency or slide projector and screen.

2.   Vehicles for demonstration and hands-on instruction.

3.   Shop area equipped with exhaust removal systems (flex hose, exhaust fan and duct), engine diagnosis equipment (including, for example, ignition oscilloscope, tach/dwell

meter, and timing light) and IR gas analyzers (including probes, sample lines, and calibration gases).

4.   Tools necessary for tune-up work and simple emission repairs.

PART III

GENERAL INFORMATION
FOR CERTIFIED MECHANICS

PART III. GENERAL INFORMATION FOR CERTIFIED MECHANICS

Requirements for becoming a certified mechanic are set out at 18 AAC 52.400 - 18 AAC 52.405. Tests are given by the local I/M Program Office or the Referee. A mechanic who meets I/M program requirements will be issued a two-year certificate that must be displayed in the station where the mechanic performs I/M tests. A one-year probationary certification is available under 18 AAC 52.400(e).

* * * * *

a.   How to Apply for Certification: A person who wants to become a certified mechanic may obtain an application form by contacting ADEC's I/M Office or the local I/M Program Office. Applications may be requested by mail at the following address:

Alaska Department of Environmental Conservation
Air Quality Improvement Section
I/M Program Administrator
555 Cordova Street
Anchorage, AK 99501
Telephone number: (907) 269-7695

Applications are also available at the following addresses:

Alaska Department of Environmental Conservation
Air Quality Improvement Section
610 University Avenue
Fairbanks, AK 99701
Telephone number: (907) 451-2167

Fairbanks North Star Borough
Inspection and Maintenance Program
3175 Peger Road
Fairbanks, AK 99709
Telephone number: (907) 459-1005

Municipality of Anchorage
Inspection and Maintenance Program
825 L Street, Room 510
Anchorage, AK 99519-6650
Telephone number: (907) 343-4200

The application must be filled out completely and legibly. All entries must be neatly printed or typed except the signature. The application must be signed by the person requesting certification and the signature must be notarized. Applications may be notarized free of charge at ADEC's I/M Office or at the local I/M program office. Valid picture identification is required.

b.   Certification Testing: The local I/M program office will publish the date, time, and place of certification testing for applicants who have not passed an approved training course. The test is described at 18 AAC 52.405.

c.   Training Courses: A description of the certified mechanic training course examinations is set out at 18 AAC 52.410. Further information is contained in Part II of this manual. Special training courses have been developed and certified by ADEC's I/M Office. These consist of about 40 hours of instruction, including classroom and shop-oriented labs. ADEC's I/M Office may be able to provide a schedule of future courses, if available.

d.   Renewal of Certification: For renewal requirements, see 18 AAC 52.425.
It is the mechanic's responsibility to know when certification expires and to recertify. The mechanic should contact the local I/M program office or the referee facility approximately three months before certification expires. This should allow three opportunities to pass the recertification test before certification expires. Mechanics who do not pass the written test must wait 30 days to retake it. A mechanic may perform I/M tests and I/M repairs only when currently certified. A mechanic who fails to renew the certification before it expires may not perform I/M tests or I/M repairs until a new certification is issued to the mechanic.

e.   Study Materials: Before the mechanic takes the recertification test, the mechanic should review the study materials received in the initial certification class (e.g., Alaska Vocational Technical Center (AVTEC) or UAA). In addition, the following publications offer information on subjects that are covered on the recertification test: (1) Engine Performance - Basic Service Training Manual, published by Mitchell Manuals, 1991; (2) Alaska I/M Program Manual, published by ADEC's I/M office; (3) Update Newsletters, published by the local I/M program office; (4) Getting to Know OBDII by Ralph Birnbaum and Jerry Truglia, 2000, or (5) other OBDII information available from a variety of sources. ADEC and local I/M Program offices may be able to assist in a search for appropriate study materials.

f.   Continuing I/M Education: Free classes in different aspects of the I/M program may be periodically offered to certified mechanics through the referee facility, including subjects such as I/M program design, computer control systems, emission control systems, and basic tune-up.

g.   Tech Line: The Tech Line is available to furnish technical information about parts applicability and vehicle specifications, **only** if that information cannot be found in the required reference materials at the certified station. The Tech Line is not designed to replace these reference materials. The Tech Line is to be used by certified mechanics and station owners or managers to contact the referee facility.

Information concerning I/M regulations or procedures is available at the MOA or FNSB local I/M program offices or the ADEC Air Quality Improvement offices in Juneau, Anchorage, and

Fairbanks. Your questions regarding I/M regulations or procedures should first be addressed to the implementing agency's I/M office. If I/M office staff cannot answer a question satisfactorily, you will be referred to the appropriate ADEC office.

PART IV

INSPECTION AND REPAIR
PROCEDURES AND STANDARDS

PART IV. INSPECTION AND REPAIR PROCEDURES AND STANDARDS

PURPOSE: This Part of the manual summarizes requirements of 18 AAC 52, and has been simplified for the convenience of certified I/M mechanics and stations. You can find more detail on the program requirements by referring to 18 AAC 52, Emissions Inspection and Maintenance Requirements for Motor Vehicles.

This Part specifies the visual and functional checks and tailpipe emission standards that must be used by certified mechanics and stations to meet the requirements of 18 AAC 52.

This Part provides detailed descriptions of I/M procedures and requirements. It is designed as a reference manual for competent I/M technicians, not as a training manual for novice mechanics.

These procedures will be modified, through the regulatory process, as the need arises to keep pace with procedural and regulatory changes needed to address technological improvements in vehicles and in testing equipment to be used in conducting those tests and to incorporate the advantages of experience gained in the ongoing performance of the I/M program. These proposed changes will be described in advance in I/M update newsletters. Those newsletters should be kept with this document for ready reference.

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* IMPORTANT NOTES:

* The tailpipe emission standards are set at a level that ensures at least 95% of the failing vehicles will have excessive emissions in stop-and-go driving. The standards for each class of vehicles are set based upon the relationship between the idle and 2500 rpm modes used during I/M testing and actual emissions in stop-and-go driving. For example, certain ages of four-cylinder engines not equipped with air injection are allowed to emit higher concentrations during I/M testing because of their lower exhaust volume. Because of the imperfect correlation between idle or 2500 rpm and stop-and-go driving, certain visual and functional defects known to cause excessive emissions are also a basis for failure. The tailpipe emission standards are targeted at achieving results in an initial failure rate of 10-12%. Visual and functional failures increase the overall targeted failure rate to 12-15%. These standards will be re-evaluated as additional test data are collected in the future.

* Below is a brief summary of some changes associated with the adoption of theAlaska2000 program.

    a)   There is a real-time connection to the Vehicle Information Database (VID) prior to the I/M test to download vehicle information and again after the I/M test to upload test results.

b)   1996 and newer vehicles are equipped with Phase Two On-Board Diagnostic
Systems (OBDII). The purpose of the OBDII system is to better control vehicle
emissions throughout the life of the vehicle and in various operating conditions.
OBDII can detect a malfunction or deterioration of various vehicle sensors and
actuators, usually well before the driver becomes aware of the problem through a
decline in vehicle performance or driveability. The sensors and actuators, along with
the diagnostic software in the on-board computer, makeup what is called "the OBDII
system." The Alaska2000 I/M test includes a readiness evaluation of the OBDII
system, then checks for stored diagnostic trouble codes and the malfunction indicator
lamp status. Beginning July 1, 2001, all model year 1996 and newer vehicles that are
not specifically exempted (due to noted communication or technical problems) will get
an OBDII test but will not get a tailpipe test. OBDII exempted vehicles will continue
to get a visual, functional and tailpipe test. After a phase-in period, it is likely that the
visual and functional aspects of the OBDII test will also be deleted as EPA guidance
suggests that they maybe redundant.

c)   Window stickers are used with this program as a secondary enforcement tool.
The testing technician affixes a sticker to the vehicle as a visual identification that the
vehicle has passed an I/M test.

* The emission inspection systems (EIS) may have display prompts and failure entry codes
that are somewhat different from those illustrated.

* REQUIREMENTS BEFORE BEGINNING AN I/M TEST:

* The owner or operator of a certified station must ensure that one telephone line is dedicated to,
and connected at all times to, each Emissions Inspection System (EIS). The telephone line
connection is needed to transfer I/M test data from the EIS to the network as well as transferring
vehicle data, program messages, updates, station and technician data from the network to the EIS.
The system will lock itself out from I/M testing if either 40 off-line tests have been performed or 4
days have elapsed without a Vehicle Information Database (VID) connection. The number of
tests and days is variable and can be adjusted by ADEC or a local I/M Program representative.
The EIS will also lock itself out if the station or mechanic I/M license is not current or valid.

* Span gas calibration is required at least every 72 hours, or the system will lock itself out from
further I/M tests.

* Real-time transfer of vehicle and test data is accomplished by a method of electronic transfer
(ET) between the EIS and the vehicle information database (VID). Some off-line testing is
allowed as a convenience to the consumer so a backup copy of the data is necessary. This data is
then transferred to the network when the VID connection is restored.

* Backup vehicle and test data is stored on a removable diskette stored in the EIS, which can be
used for about 2,000 tests. Before the disk is filled up, it is replaced with a blank disk by a

representative of either ADEC's I/M office or the local I/M program office. Representatives of ADEC's I/M office, or the local I/M program office, and EIS service personnel are the only persons authorized to handle disks or recording equipment in the EIS. The data collected is analyzed by a computer to determine the overall effectiveness of the I/M program and to check the quality of the work performed by each mechanic.

* An EIS is rugged, accurate and well engineered. But, to do the job, it is designed to do, it requires a steady and uninterrupted source of power. Although the EIS has built-in protection to deal with power fluctuations, this protection may not be adequate to handle voltage "spikes" that come down the line to the EIS. It is recommended that a "spike protector" be installed between the EIS and the electric wall outlet to protect the EIS from "spikes" and reduce downtime.

* GENERAL PROCEDURES: Listed below is a summary of the general steps that must be followed during the inspection and repair of gasoline-powered vehicles brought to a certified station for I/M testing. Perform all steps in the order set out in this program manual. The steps summarized here are described in further detail in the following sections of this document. The certified mechanic shall

1. properly complete a cost quotation and obtain an authorizing signature from the motorist;

2. perform a preliminary inspection to determine if the vehicle is safe to test;

3. perform an initial ("I") test on the vehicle;

4. if the vehicle passes the "I" test, place the sticker insert onto the certificate sticker and affix the sticker to the bottom left corner of the windshield. Until August 31, 2002, adhere the smaller sticker to the paper certificate of inspection and provide the motorist with that paper certificate and the Vehicle Inspection Report (VIR). Beginning on September 1, 2002, adhere the smaller sticker to the Vehicle Inspection Report (VIR) and provide the motorist with the VIR;

5. if the vehicle fails the "I" test, unless the implementing agency specifies otherwise, provide the motorist with an itemized estimate of repairs (repair cost estimate) including

    A. the cost of a diagnosis for OBDII test failures;

    B. the cost to the motorist of the parts for each repair;

    C. the cost to the motorist of the labor for each repair; and

    D. a quotation showing which repairs the certified station can perform for an amount that satisfies the current cost minimums;

6. after the motorist authorizes you to proceed with repairs, prepare a preliminary work order and secure the motorist's signature;

7. perform all necessary repairs on the vehicle, if all repairs can be performed under the applicable repair cost minimum;

8. if necessary, unless the implementing agency specifies otherwise, provide the motorist with a referee facility referral form;

9. perform an after-repair ("A") test on the vehicle;

10. provide the motorist with a final work order showing the repairs performed on the vehicle; and

11. if the vehicle passes the "A" test, adhere the certificate of inspection sticker to the vehicle, adhere the smaller sticker to validate the VIR and provide the motorist with that VIR.

* PRELIMINARY INSPECTION: The mechanic should normally be able to determine that a vehicle is not in a testable condition during the preliminary inspection conducted under 18 AAC 52.530 and should reject an untestable vehicle before beginning the inspection described in this Part.

You should check the cause of an illuminated engine warning light before you begin an emissions test. If the light does not indicate a condition that could endanger the mechanic or the vehicle, you may proceed with I/M testing.

> **Vehicles listed in 18 AAC 52.530(c) must be referred to the referee facility.**

* IDENTIFYING GREY MARKET VEHICLES: A grey market vehicle may have one or more (or none) of the following attributes:

(1) an emission decal or vacuum hose diagram that does not state that the vehicle conforms to EPA or California Air Resources Board (CARB) emission regulations;

(2) no emission decals or certification labels;

(3) decals or labels in a foreign language;

(4) an odometer printed in kilometers only or in kilometers over miles;

(5) no rear seat belts;

(6) no emission controls (with the vehicle usually being very clean and showing no evidence of tampering); or

(7) no United States Department of Transportation sticker on the door or door jamb.

* Questions concerning a particular vehicle may be directed to the referee facility.

* COST QUOTATION: Certified I/M station personnel must provide each customer with a cost quotation for the cost of the inspection and issuance of a certificate of inspection, as required under 18 AAC 52.515, before you begin an I/M test.

* Vehicles that fail the visual inspection, the functional tests, the OBDII test or the exhaust analysis cannot receive a certificate of inspection and must be repaired as necessary and retested unless a waiver is issued by the I/M Program Office.

* USED AUTOMOBILE DEALERS: Either a certificate of inspection or a certificate of non-compliance is required under AS 45.45.400(a) before DMV will transfer the title of any vehicle to a person with a residence address in an I/M area. This requirement applies to any used vehicle sold by anyone who is a motor vehicle dealer as defined at A.S.08.66.090.

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* THE TEST

a.   Beginning Official I/M Test: After determining that a vehicle is not exempt under 18 AAC 52.005(f) or is required to be referred to the referee facility under 18 AAC 52.530(c) and after determining that the vehicle is safe for testing, you may proceed with the I/M test as required in this Part.

Reminder: A TAILPIPE TEST SHOULD NEVER BE PERFORMED ON A DIESEL-POWERED VEHICLE. THE OWNER OF A DIESEL-POWERED VEHICLE OR OTHER VEHICLE DESCRIBED IN 18 AAC 52.530(c) MUST BE REFERRED TO THE REFEREE FACILITY OR LOCAL I/M OFFICE.

   1. Log On To Emissions Inspection System: Select the "OFFICIAL I/M TEST" option from the Vehicle Emissions Inspection menu displayed on the video screen. If the EIS is not already turned on, up to 15 minutes is required for warm-up. If the EIS has not been calibrated within the last 72 hours, a prompt will appear indicating that the calibration must be performed before an I/M test can be performed. Calibration consists of

      A. a gas calibration with on-board calibration gases; and

B. a leak check: when performing the leak check, the probe must be installed and only the tip of the probe may be blocked. At least one EIS at each certified station must pass the leak test with the dual probe attachment installed.

2. Entry of Vehicle Information: Initiate an I/M test by entering the number "1" (corresponding to the designation "Official I/M Test") from the EIS's Vehicle Emissions Inspection menu. The EIS will then provide a series of display screens to prompt you to enter the following information into the EIS:

A. Confidential mechanic access code: This is the five-digit numeric code assigned to each certified mechanic by the local I/M program office for entry into the EIS. The mechanic to whom the code is assigned must keep it confidential. It is a violation of 18 AAC 52 for any other person to use this code. The local I/M program office will enter the certification expiration date for your license into the EIS. When your access code is entered, the EIS will compare that date to the current (test) date. If the test date is prior to the expiration date, the EIS will allow you to proceed. If the test date is equal to or after the expiration date, you will be instructed to contact the local I/M program office to renew certification or report a possible error in the expiration date. If the test date is after the expiration date, you will not be allowed to proceed but will be informed that your authorization to perform I/M tests has expired. You will be instructed to contact the local I/M program office to renew certification or report a possible error in the expiration date.

B. I/M Test Type: Enter "I" for the initial I/M test of the current inspection cycle. If the vehicle was tested previously in the current I/M test cycle at a different certified station, and was found to need repairs, enter "I" for the before-repairs I/M test as well. (Although there is technically only one initial I/M test per inspection cycle, the EIS only allows the input of "I" or "A" for test type. Therefore, all before-repair tests should be entered as "I" tests. Data analysis of EIS test records collected from all I/M stations will be used to differentiate between initial "I" tests and subsequent before-repair "I" tests.) After completion of repairs, use "A" for the after-repairs I/M test. It is a violation of these procedures for a certified station to perform I/M repairs or an "A" test on a vehicle on which that station has not performed an "I" test. Referee I/M mechanics will be allowed to enter an "R" for a referee type I/M test.

C. Registration Renewal Number (RRN): The EIS will prompt for the eight digit RRN found either on the registration renewal notice or on a previous vehicle inspection report (VIR). You may scan or manually enter the number. If the RRN is not available the EIS will proceed to the vehicle identification number (VIN) entry. When the RRN entry is successful the EIS will attempt to contact the Vehicle Information Database (VID). If the VID connection is successful and the RRN is matched to a vehicle in the network database, the VID will return available vehicle identification information to the EIS and proceed to the odometer entry.

The vehicle information that will be transmitted to the EIS, if available, includes:

1. VIN/RRN/License Plate Number;
2. Model Year;
3. Body Type;
4. Vehicle Standards Type Code;
5. GVWR;
6. Make;
7. Model;
8. Number of Cylinders;
9. Engine Size;
10. Transmission Type;
11. Fuel Type; and
12. Emissions Certification Type.

D. Vehicle Identification Number (VIN): If possible, the VIN should be entered using the EIS bar code reader. The VIN bar code may be scanned from either the vehicle, the registration renewal form, or a previous VIR. If the bar code is not readable, the EIS will prompt you to manually enter the VIN. Motorhomes do not always have the same VIN for the frame and chassis. To enter motorhomes in the EIS, use the VIN on the registration renewal form that matches either VIN on the vehicle.

E. Vehicle license plate number: The EIS will prompt you to enter the license plate number. For a vehicle without valid Alaska license plates, enter "OS." (If an "OS" is entered, the EIS will automatically add the last six (or the maximum number, if less than six) characters of the VIN entry specified to the license plate entry following the OS characters. The full license plate entry for the vehicle (OS+VIN characters) will be entered into the vehicle inspection record and printed on the vehicle inspection report.) The "OS" code includes out-of-state plates, temporary plates, and United States government plates. Courtesy plates issued by the DMV do not have valid Alaska license plate numbers. For a vehicle with courtesy plates, enter the six-character license plate number from the registration certificate and use it for all I/M documentation. License plates with numbers 1 to 63 are courtesy

plates owned by the governor or a legislator. Embassies of foreign governments display courtesy plates on their vehicles. These license plate numbers are not to be used in the EIS unless they match the license number on the registration certificate.

F. VID Communications: The EIS will automatically initiate a telephone call to the VID immediately after either the successful entry of the RRN or after entry of the VIN and license plate number. If the connection to the VID is successful and a match is found for the vehicle in the database, vehicle identification data will be downloaded to the EIS. The information provided for the vehicle being tested includes: the vehicle model year, the make, the model, the vehicle body type, the vehicle standards type code, the GVWR (where applicable), the number of cylinders, the engine size, the transmission type, the fuel type, the emissions certification type, and the vehicle registration expiration month and year. If the VID connection is not successful or if there is no match to a vehicle in the database, the EIS will prompt you to manually enter each of these categories.

G. Vehicle model year: Enter the four digits of the model year. The EIS will not accept for testing any vehicles older than model year 1968.

H. Vehicle make: Select the appropriate make from the list displayed by the EIS. If the make is not listed, type in the full name of the manufacturer. "SPCN" should be entered for a kit car, representing the abbreviation for a "specially constructed" vehicle.

Figure 2 illustrates the EIS display of vehicle makes:

Figure 2
VEHICLE MAKES

AC	ISUZU
ACURA	ITASCA
AIRSTREAM	JAGUAR
ALASKAN	JAMBOREE
ALFA ROMEO	JEEP
ALLEGRO	JENSON
AMERICAN GENERAL	KIA
AMC	LAFORZA
APACHE	LAMGORGHINI
ARISTOCRAT	LANCIA
ASTON MARTIN	LEXUS
AUDI	LINCOLN
AURORA CARS	LOTUS
AUSTIN	MALLARD
AVANTI	MASERATI
AVCO	MAZDA
AVION	MERCEDES BENZ
BEAVER	MERCURY
BENTLEY	MERKUR
BERTONE	MG

BITTER		MISTSUBISHI
BLUEBIRD		NISSAN (DATSUN)
BMW	NUMMI	
BOUNDER		OLDSMOBILE
BRICKLIN		OPEL
BROUGHAM		OVERLAND
BUGATTI		PACE ARROW
BUICK		PANOZ
CADILLAC		PANTERA
CALLOWAY		PANTHER
CHAMPION		PEUGOT
CHECKER		PNINFARINA
CHEVROLET		PLYMOUTH
CHINOOK		PONTIAC
CHRYSLER		PORSCHE
CITROEN		RENAULT
COACHMAN		REVCON
COMMANDER		ROLLS-ROYCE
DAIHATSU		ROVER
DELOREAN		RUF AUTOMOBILES
DE TOMASO		SAAB
DODGE		SALEEN
DOLPHIN		SATURN
DREAMER		SHELBY
EAGLE		SIMCA
EL DORADO		SOUTHWINDS
ESTABLISHMENT		STERLING
EXCALIBUR		SUBARU
EXECUTIVE		SUNBEAM
FERRARI		SUNRADER
FIAT		SUPERIOR
FLEETWOOD	SUZUKI	
FORD		TIOGA
GEO		TOYOTA
GMC		TRIUMPH
GRUMMAN		TVR
GVSI		UTILIMASTER
HOLIDAY RAMBLER		VOLKSWAGON
HONDA		VOLVO
HYUNDAI		WANDERLODGE
IHC		WINDJAMMER
INFINITI		WINNEBAGO
INTERNATIONAL		YUGO
ISI		ZIMMER

I. Vehicle Model: Select the appropriate model from the list displayed by the EIS. If the model is not listed, type in its full name.

J. Vehicle Body Type: Select the appropriate vehicle body type from this list.

      (1) SEDAN;

      (2) STATION WAGON;

      (3) PICKUP;

      (4) SPORT/UTILITY VEHICLE;

      (5) MINIVAN; and

      (6) FULL-SIZE VAN.

K. Gross Vehicle Weight Rating (GVWR): If the vehicle is a truck or a motorhome, enter the GVWR which can be found on a label affixed to the vehicle, usually located on the driver's door or doorjamb.

L. Vehicle certification type: Enter "C" if the vehicle is California-certified, "F" if it is federally certified, "R" if it has a referee label, or "N" if there is no label. If you enter an "R," the EIS will display a message prompting you to enter the referee label number. Enter the label number, starting with the letter for the program area, followed by leading zeros and then the actual number on the label, until the 8-character field is filled. For example, a Fairbanks referee label number of 358 would be entered as F0000358. If there is no label number, enter "N" for "None," press "Continue," and refer the motorist to the referee facility.

M. Number of cylinders: Enter only numbers from 1 to 16. If a vehicle with a rotary engine is being tested, enter "R."

N. Vehicle engine size: Enter the engine size followed by one of these codes: "I" for cubic inches, "L" for liters, or "C" for cubic centimeters.

    Note: The engine size will be expressed in cubic centimeters on any test recalled from the EIS data files, since that is how it is stored in the EIS.

O. Vehicle transmission type: Enter either "A" for automatic or "M" for manual.

P. Vehicle fuel type code: Enter the type of fuel the vehicle is equipped to use: Enter "G" for gasoline or required oxygenated fuel blends, "B" for bi-fueled, "P" for LPG, "N" for LNG or CNG, "M" for methanol blends of greater than 20%, "E" for ethanol blends of greater than 20%, "D" for diesels, or "L" for electric vehicles. The EIS will only allow specifically authorized mechanics to test alternate-fueled vehicles. If a code other than "G" is entered, and the EIS does not recognize you as having authorization to test alternate-fueled vehicles, the EIS will prompt you to refer the vehicle to the referee facility. You should abort the test, and enter abort code "15" for a referee referral. Charging the customer for aborting a test improperly performed on such a vehicle is prohibited by 18 AAC 52.515 (j)(4).

Q. Vehicle Registration Expiration: Enter the vehicle registration expiration month and year as currently displayed on the vehicle license plate or the registration renewal card. You will only be prompted to enter the information if there is no Vehicle Information Database (VID) contact or if no matching vehicle record is found. If registration expiration information is not available for the vehicle being tested, the I/M mechanic may call ADEC or the local I/M Program Office with the VIN number to obtain that information. If the vehicle registration expiration date is not available, the I/M test must be aborted. For out-of-state ("OS") vehicles, the EIS will automatically assign a date to this field.

R. Vehicle Odometer Reading: Enter the odometer reading of the vehicle. For older vehicles with relatively low mileage, check with the vehicle owner to see if the odometer has rolled over (gone over 100,000 miles). If so, enter the actual mileage in the EIS.

If the vehicle odometer reading is obscured or unreadable, enter "NONE" into this field.

S. Dual exhaust: Enter "Y" to indicate the vehicle is equipped with a dual exhaust system or "N" to indicate it is equipped with a single exhaust system.

T. Vehicle Data Entry Confirmation: Review the vehicle data entered and make any corrections necessary. Blank entries are not allowed.

b. Identify the Emission Control System Applications: Proper inspection and certification of a vehicle requires you to know the year, make and model of the vehicle, the engine size, and whether it has the required emission control equipment.

1. Underhood label: You must examine the underhood label, if available, and check a nationally published emission control system application manual. Since the 1972 model year, federal law requires that every new vehicle be equipped with a permanent label within the engine compartment, containing the following or similar information:

A. name of manufacturer;

B. statement as to whether the vehicle conforms to California or federal emission control requirements;

C. engine size in cubic inches;

D. exhaust emission control type: initials like OC/ORC/TWC (catalyst types), AIR (air injection reactor), and FI (fuel injection) may be used; and

        E.   engine tune-up specifications and adjustments recommended by the manufacturer, including the speed, ignition timing, air-fuel mixture, and idle CO setting, if adjustable.

2. Unlabeled vehicles: There are several ways you can identify the year of an unlabeled vehicle. If available, use information contained on the vehicle registration if the registration is clearly for the particular vehicle being inspected. Another possibility is to refer to the vehicle ID number (VIN), then use the required emission control manuals to identify the engine and its required emission control devices, as well as adjustment values.

3. Emission control manuals: The emission control manuals (ECS application guides) contain general emission control system descriptions as well as specific system and device applications for each vehicle sold in the United States. They may also offer diagnostic connector locations and reset procedures for emissions maintenance reminder lights.

4. Specific vehicle information:

1981-1984 Internationals - A source of ECS information for late-model Internationals is Chilton's 1984 Truck and Van Service Manual.

Motorhomes - There are some motorhomes that were manufactured with an engine older than the model year of the vehicle. In these cases, use the vehicle emissions control information (VECI) label to determine how to I/M test the vehicle. If this causes a problem, the vehicle may be referred to the referee facility.

c. Perform Visual Inspection: Except for changes specifically allowed by the I/M office, all vehicles required to participate in the I/M program must be tested in the configuration in which they were certified by the EPA or by the CARB.

There is no visual inspection for 1968 through 1974 model-year vehicles. The EIS will skip the visual check prompts for these vehicles. Unless local I/M Programs do not require a visual and functional test on OBDII tested vehicles, all 1975 and newer vehicles must be visually inspected to determine if a vehicle that was originally factory-equipped with the ECS components listed in this section still has those components properly installed and unmodified. The EIS will prompt you to perform a series of visual checks on the vehicle's ECS.

Any vehicle on which systems listed in this section are removed, disconnected, modified, or defective must fail the visual inspection.

Following is an example of a typical EIS screen display with entries and codes. Codes are defined in "1" below.

Figure 3
Visual Inspection Items

ENTER VISUAL INSPECTION CODES (P, D, M, S, N, F)

OXYGEN SENSOR	P
VACUUM HOSES AND WIRES	D
POSITIVE CRANKCASE VENTILATION	M
EXHAUST GAS RECIRCULATION	S
CARBURETOR OR FUEL INJECTION	P
MANIFOLDS AND IGNITION	F
INTAKE AIR HEATER	N
EARLY FUEL EVAPORATION	P
FUEL EVAPORATIVE CONTROLS	D
AIR INJECTION SYSTEM	M
CATALYTIC CONVERTER	S
OTHER EMISSIONS RELATED COMPONENTS	N

The EIS will display a complete list of all possible devices for each vehicle and you must make a valid entry for each item on the menu before the software will proceed to the next item.

The entries must be made in sequence but you are allowed to edit previous entries at any time before beginning the emissions tailpipe or OBDII test.

In addition to requiring you to make a positive entry for each ECS, the EIS will not default to "Pass," "Not Applicable" or "Defective." Determine through the use of suitable references which of the devices were originally installed on the vehicle being inspected.

1. Code Definitions: Each required device must be visually inspected to determine if the vehicle will "Pass (P)," or if a device is obviously "Missing (S)," "Modified (M)," "Disconnected (D)," or "Defective (F)" or whether the category is "Not Applicable (N)." These codes are defined as follows:

    A. Pass: Use the "Pass" code "P" when an item is present on the vehicle, properly installed and appears to be operating as designed.

    Example 1: The ECS guide shows that a catalytic converter (CAT) is required. During the visual inspection of the vehicle, observe that a CAT is present, is located immediately under the heat shields attached to the vehicle underbody and the underbody shows no excessive signs of scorching. The inlet and the outlet appear to be the correct size, no large dents or ruptures are present and the CAT is the correct type (Ox CAT or 3-Way). Enter "Pass" by typing the letter "P" into the EIS.

    Example 2: The ECS guide shows that an air injection system (AIS) is required. During the visual inspection, if you see that the air pump is present, is properly equipped with a drive belt, and all of the required tubes, hoses and

valves are present, including the downstream air tube connected to the CAT at the bottom end and that nothing is visible that would indicate that any of these items are defective, enter "P" into the EIS.

B. Disconnected: Use the "Disconnected" code "D" when an emission control system is present but disconnected.

Example 1: The drive belt to the air pump has been removed. Identify the AIS as "Disconnected" by entering "D" into the EIS.

Example 2: The engine is normally equipped with a thermal vacuum valve (TVV) placed between a ported vacuum source and the vacuum advance mechanism. You notice that a hose has been routed directly from the vacuum advance to manifold vacuum, thereby passing the TVV valve. You should identify the VACUUM HOSES AND WIRES as "Disconnected" by entering a "D" into the EIS.

C. Modified: Use the "Modified" code "M" when an emission control system is present and connected but its function has been obviously modified.

Example 1: While performing a visual inspection of a TAC, you observe that the air filter element has been removed from the air cleaner assembly. You should identify the thermostatic air cleaner system as modified.

Example 2: The engine is equipped with what may be a replacement carburetor. You check the part number with a parts supplier and find out the carburetor is for an earlier model high-performance vehicle. You would then identify the CARBURETOR OR FUEL INJECTION as "Modified" by entering "M" into the EIS.

D. Missing: Use the "Missing" code "S" when an emission control system has been removed from the vehicle.

Example 1: The ECS manual shows that a CAT is required. During the inspection, you see that a test pipe has been installed in place of the CAT. Identify the CATALYTIC CONVERTER as "Missing" by entering "S" into the EIS.

Example 2: The VEC label shows that an AIS was originally installed on the engine. You notice that the air pump has been removed. Identify the AIR INJECTION SYSTEM as "Missing" by entering "S" into the EIS.

E. Not Applicable: Use the "Not Applicable" code "N" when a particular emissions control related device was not originally installed on the vehicle, or is not required to be inspected visually.

Example 1: A 1981 model Volvo was not factory-equipped with an AIS. You would identify the AIR INJECTION SYSTEM as "Not Applicable" by entering "N" into the EIS.

Example 2: A 1980 Honda with federal certification should receive a "Not Applicable" under the visual inspection category for the CAT because this model was not factory-equipped with that system. You should enter "N" into the EIS next to the AIS item to indicate that the item is "Not Applicable."

F. Defective: Use the "Defective" code "F" when an emission control related device is not functioning properly, but is not disconnected, modified, missing, or not applicable.

Example 1: If, while performing a visual inspection of an AIS, you note that the check valve is badly burnt and rusted and the hose connected to it is burnt and hardened, enter "F" into the EIS to indicate that the AIS is "Defective." When performing the functional check of the AIS for the next section of the I/M test, you should disconnect the hose at the opposite end from the check valve and verify that there is little or no pulsation, or that excessive exhaust is escaping past the check valve.

Example 2: If, while performing a visual inspection of a TAC, you note that the heat transfer tube is badly crushed and has a hole that allows unheated air to enter, enter "F" into the EIS to indicate that the TAC is "Defective."

2. Oxygen Sensor: When inspecting the Oxygen (O_2) Sensor, lightly tug on the wire at the sensor. If the wire feels "springy" or "give" is felt, check to see if the wire is connected to the sensor. Check to see that the other end of the wire is connected. Enter the appropriate EIS failure code if any of the following conditions are present: (1) the wire is disconnected; (2) the sensor is broken; or (3) the vehicle requires a sensor, but it is not present. Enter "N" if the vehicle does not require a sensor. If the vehicle requires a sensor, it is present, and no problem is found, enter "P."

3. Vacuum Hoses and Wires: Obvious problems with hoses and wires must be identified during the visual inspection. Look for loose ends of vacuum hoses and wires in the engine compartment. Check for missing vacuum hoses, which may be evident by the presence of a short piece of vacuum hose attached to the carburetor or intake manifold and plugged with a screw or bolt. Check for nipples or control devices that have no vacuum hose connected to them. Inspect vacuum hoses and wires to determine whether any hoses are cracked or broken and whether any wires are bare or broken. Enter the appropriate EIS code.

4. Positive Crankcase Ventilation (PCV) System: Inspect the PCV system to determine if the system is present, properly installed and connected. Enter the appropriate EIS code.

5. Exhaust Gas Recirculation (EGR): Local I/M Programs may require an inspection of this

system based on whether an oxygen (O_2) sensor is required for the vehicle or not. For vehicles that do not require an O_2 sensor, the visual inspection for the EGR is limited to determining that it has no vacuum leaks. A "Not Applicable" (N) entry should be entered and any vacuum leaks identified and failed in the functional test under Vacuum Leaks. If the vehicle requires an O_2 sensor, inspect the EGR to determine if it is present and properly installed and connected. Enter the appropriate code into the EIS.

Local I/M Programs may require an inspection of this system to be based on an EGR system position sensor rather than an oxygen sensor. In this case you should determine whether the vehicle is required to have an EGR system position sensor. For vehicles that do not require an EGR system position sensor, the visual inspection is limited to determining that the system has no vacuum leaks. If the vehicle is required to have an EGR system position sensor, inspect the EGR system to determine that all components are present, properly installed and connected. Enter the appropriate code into the EIS.

6.   Carburetor or Fuel Injection: The EIS will allow entries for either carburetor or fuel injection. A "Not Applicable" entry cannot be entered for both. "Pass," "Disconnected," "Modified," "Missing," or "Defective" can only be entered for the applicable fuel system. In most cases, the air cleaner assembly must be removed from the vehicle to perform these inspections.

To determine if a carburetor has been replaced with an unacceptable aftermarket unit, look for plugged vacuum sources, adapter plates, or a misshapen, misaligned or disconnected carburetor or choke linkage. If you see anything that might indicate a problem, the carburetor number must be checked to determine if the correct carburetor is installed. The choke must be checked for linkage binding and to see that the choke plate is free to open and close fully. The use of an adapter plate between the carburetor and intake manifold is not permitted. Both systems fail.

For a fuel-injected vehicle, check to see that there are no obvious modifications to the fuel injection system. Enter the appropriate code into the EIS.

7.   Manifolds and Ignition: Check to see that the intake and exhaust manifold will accept all emission control equipment required for the vehicle in a manner that will allow full operation of that equipment. Check that the exhaust manifold is of the original equipment type. Note that this includes all early fuel evaporative (EFE) equipment the vehicle was originally manufactured with, regardless of the age of the vehicle.

The I/M program allows aftermarket intake manifolds if the above criteria are met. The I/M program allows tubular headers if (1) the above criteria are met, and (2) the part has an executive order number (issued by California Air Resources Board upon certification of an aftermarket part) that applies to the make, model, and year of the vehicle being tested. In all

other cases, the intake and the exhaust manifold must be the original equipment type.

The ignition system must have no unapproved modifications to it. Some indications of modification are distributors with no provision for vacuum or electronic ignition advance and aftermarket control modules attached to the vehicle.

Enter the appropriate code into the EIS.

8.   Intake Air Heating System (TAC): Check to see that the heat stove is present, not rusted so badly as to degrade its performance, and properly attached. The hot air transfer tube must be present, properly connected and not cut or torn. The TAC vacuum motor(s) must be properly connected with the vacuum lines properly connected to the motor(s), control units and vacuum source. The air cleaner gaskets (body to carburetor and lid to body) and lid must be properly installed. Some vehicles were manufactured with a cold air delivery tube on the air cleaner snorkel. These tubes are not required. Enter the appropriate code into the EIS.

9.   Early Fuel Evaporation (EFE): There are several types of EFE systems and local I/M Programs have different requirements for which systems to test as well as how to test them. Local I/M Programs may require an inspection of the bi-metal, spring-operated flapper type found in older vehicles. This device is located in the exhaust manifold or in a spacer between the exhaust manifold and the exhaust pipe. Check to see that it has not been eliminated, especially if aftermarket exhaust parts have been installed.

Some vehicles use a vacuum-operated EFE in a similar location. Check to see that it is properly installed and that the vacuum lines are properly connected to a temperature control and a vacuum source.

Later-model vehicles use electrically operated heater grids or plates.   These systems may have one or two wires and are typically located under the intake manifold, carburetor or throttle body injection unit. Check to see that the wires are in good condition and the connectors are properly connected.

Check to see that the EFE system is properly installed in the vehicle being inspected and enter the appropriate code into the EIS.

10.   Fuel Evaporative Emission Controls (EVAP): Local I/M Programs may require an inspection of this system to be based on whether an oxygen (O_2) sensor is required for the vehicle or not. For vehicles that do not require an O_2 sensor, the visual inspection of the EVAP system is limited to determining that it has no vacuum leaks (the EVAP system can be disconnected). If the vehicle requires an O_2 sensor, inspect the EVAP system to determine if it is present, properly installed, and connected. Check to see that the vacuum hoses are properly connected to the EVAP and to a vacuum source, and the purge line is properly connected and not pinched shut or burnt. Enter the appropriate code into the EIS.

Local I/M Programs may require an inspection of this system to be based on an EVAP

system position sensor rather than an oxygen sensor. In this case you should determine whether the vehicle is required to have an EVAP system position sensor. For vehicles that do not require an EVAP system position sensor, the visual inspection is limited to determining that the system has no vacuum leaks (the EVAP system can be disconnected). If the vehicle is required to have an EVAP system position sensor, inspect the EVAP to determine that all components are present, properly installed and connected. Check to see that the vacuum hoses are properly connected to the EVAP and to a vacuum source and that the purge line is properly connected and not pinched shut or burnt. Enter the appropriate EIS code.

11.   Air Injection System (AIS): Components of the air injection system that must be checked will generally include an air pump or pulse air device, air supply and vacuum signal lines, air distribution tubes and air control valves including the bypass, diverter, gulp, relief, delay, temperature, air switching and check valves.
Make the following checks:

   A.   check that there are no missing air pump drive belts, tubing, valves or hoses;

   B.   check that all tubes and hoses are properly connected at both ends;

   C.   check that vacuum hoses are properly connected to vacuum-operated components, the vacuum control units and to the correct vacuum source; and

   D.   check that the AIS is properly connected to the CAT on some 1980 and later models.

If you indicate that a vehicle is equipped with an AIS, the EIS will prompt you to enter whether the system is a pump air or pulse air system. After selection of the appropriate system, the EIS will prompt you to enter whether the entire AIS passes the visual inspection. If you enter a "P" for "ALL PASS," the EIS will proceed to the next component to be visually inspected. If you enter an "F" for "FAIL," the EIS will display a listing of the components of the appropriate system (either pump or pulse air). Enter into the EIS the appropriate code indicating the condition of each of those components.

   12. Catalytic Converter (CAT):

   A.   Check to see that the exhaust system is properly installed and connected and conforms to the configuration in which the vehicle was manufactured. Vehicles equipped with CATs are required to maintain the certified configuration of the exhaust system from the rear of the rearmost CAT forward. On OBDII equipped vehicles the requirement to maintain the certified configuration of the vehicle extends to the rearmost oxygen sensor behind the rearmost CAT.

   B.   Check to see that the CAT and all related components are properly installed on the engine and no modifications have been made. The CAT or CATs must be connected. In addition, a downstream air tube must be connected to the CAT on

some vehicles.

    C.   Check to see if the CAT is installed in the proper location with the identification tag visible.

    D.   Check to see if adaptations have been made to the angle or size of the pipe in order to fit the inlet or outlet of the CAT. If this condition or any condition indicates that the wrong CAT has been installed, verify the identification number of the CAT.

    E.   Check the CAT itself for evidence of physical damage such as large dents, ruptures, punctures, or pellets coming out of the tailpipe. Also check for signs of high-temperature discoloration or scorching on the vehicle underbody, indicating overheating of the CAT. If signs of overheating exist, refer the vehicle to the referee facility.

    Enter the appropriate code into the EIS.

13.   Other Emission-Related Components: Obvious problems with other emission-related components must be identified during the visual inspection. Look for evidence of obvious disconnection or modification and enter the appropriate EIS code.

    This category may be used to accommodate obvious problems with emissions control devices or emissions-effective defects not appropriate for entry under categories presently listed in the EIS. Enter "N" into the EIS for this category unless you visually identify an emissions-related defect that does not fit one of the other visual inspection categories. After entering visual inspection results, the EIS will prompt for the results of the functional checks.

d. Perform Functional Inspection: Except for changes specifically allowed by the local I/M Program Office, vehicles required to be tested by the I/M program must be tested in the configuration in which they were certified either by EPA or by CARB.

There is no functional inspection for 1968 through 1974 model-year vehicles. The EIS will skip the functional check prompts for these vehicles. All 1975 and newer vehicles must be functionally checked to determine if the components listed in this section are correctly operating on vehicles that were originally factory-equipped with those components.

The EIS will prompt you to perform a series of functional checks on the vehicle's ECS. The functional inspection must include the items listed in the following example of the EIS video display. Any vehicle on which any of the items listed are removed, disconnected, modified, or defective must fail the functional inspection.

Figure 4
Functional Test Items

ENTER FUNCTIONAL TEST CODES (P, F, N)

EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR	P
MALFUNCTION INDICATOR LAMP/CHECK ENGINE LIGHT (MIL)	P
MAJOR VACUUM LEAKS	F
POSITIVE CRANKCASE VENTILATION (PCV)	P
INTAKE AIR HEATER (TAC)	N
EARLY FUEL EVAPORATION (EFE)	P
AIR INJECTION SYSTEM (AIS)	F

The entry codes used for functional tests, and shown in the above example, are "P" for "Pass," "F" for "Fail," and "N" for "Not Applicable." Those terms are defined as follows:

1. Pass: Use the "Pass" code when an item is present on the vehicle, properly installed, and functioning correctly.

> **Example**: Using a hand-operated vacuum pump with a gauge, apply vacuum to a TAC motor and observe the operation of the flapper with a hand mirror. The flapper travels from fully closed to fully open when vacuum is applied. The gauge shows the vacuum does not leak down, and the flapper freely returns to rest position when vacuum is removed. Enter "Pass" by typing the letter "P" into the EIS.

2. Fail: Use the "Fail" code when an ECS has been removed from the vehicle or is present but is either installed improperly or does not function properly.

> **Example:** If you hear a hissing sound in the engine compartment and find a cracked vacuum hose that is leaking badly, enter "Fail" for "Major Vacuum Leaks" by typing the letter "F" into the EIS.

3. Not Applicable: Use the "Not Applicable" code when an item was not originally installed on the vehicle.

Using suitable references, determine which of the ECS mentioned above were originally installed on the vehicle being inspected.

You must make a valid entry for each item on the menu before the EIS will proceed to the next item. When performing a functional test, each prompt must be answered with either a "P" for "Pass," an "F" for "Fail"or an "N" for "Not Applicable."

Note that some items, such as the PCV system, the TAC, the EFE and the AIS, will receive both visual and functional checks.

> **A.** Emission Control Maintenance Light/Indicator: This is also known as the "EGR," "O_2" or "Sensor" light. Beginning in early 1972, some manufacturers installed instrument panel warning lights to alert the driver to needed maintenance for EGR systems.

Scheduled EGR system maintenance is not required. In addition, some manufacturers installed instrument panel warning lights to alert the driver to scheduled replacement or maintenance of O_2 sensors. The need for scheduled O_2 system maintenance and illumination of an O_2 sensor warning light are both a cause for failure of the vehicle. If the emission control maintenance light or warning flag is displayed for any reason, enter the code "F" for "Fail" into the EIS. If you enter an "F" for fail, the EIS will display the following prompt:

DETERMINE IF THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR IS ON DUE TO SCHEDULED REPLACEMENT OR MAINTENANCE OF THE OXYGEN SENSOR. IF THE LIGHT/INDICATOR IS ON BECAUSE OF SCHEDULED OXYGEN SENSOR MAINTENANCE OR REPLACEMENT, ENTER "Y" FOR YES. IF IT IS ON FOR ANOTHER REASON, ENTER "N" FOR NO.

If, after entering an "F" for the emission control maintenance light/flag, you determine that the light/flag is on for a reason other than scheduled maintenance or replacement of an oxygen sensor, enter a "N," and the vehicle will be passed for this check, but a service message will be printed on the VIR.

If you enter a "Y," signifying that the light/flag is on due to scheduled maintenance or replacement of an oxygen sensor, the vehicle will be failed and the following message will be printed on the VIR:

THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR INDICATES THAT THE OXYGEN SENSOR IS IN NEED OF SCHEDULED MAINTENANCE AND/OR REPLACEMENT. THE OXYGEN SENSOR MUST BE CHECKED, AND EITHER REPLACED OR THE TIMER RECYCLED, BEFORE THE VEHICLE CAN PASS THE EMISSION INSPECTION.

B. Malfunction Indicator Lamp / Check Engine Light (MIL): If the vehicle you are testing is equipped with a malfunction indicator lamp it must illuminate briefly when the ignition key is cycled from off to run. If the MIL does not illuminate when the key is turned to the run position or if the MIL remains illuminated, enter an "F" for fail into the EIS.

    1. Catalyst Replacement Light: Beginning with model year 1975, additional warning lights or warning flags were added to indicate a scheduled replacement of catalytic converters. Scheduled replacement of catalytic converters are not required for purposes of 18 AAC 52. Illumination of a catalyst warning light or display of a catalyst warning flag is not a cause for inspection failure.

    2. Malfunction Indicator Lamp (MIL): Some vehicles with computer controls have "Check Engine" lights or "Malfunction Indicator Lamps" to notify the driver of system malfunctions. Repairs indicated by these fault-related indicator lights are required. Enter the "F" code for "Fail" into the EIS if these warning lights are

illuminated.

C. Warning Lights Functional Test: To perform the functional test for warning lights, turn the ignition key to the on or run position without starting the engine (key-on engine-off) and observe the MIL and O_2 light for operation. If the MIL or O_2 light does not come on, the vehicle should be failed because of inoperative lights. Next, the engine should be started and allowed to idle (key-on engine-on). If the MIL or O_2 light remains on, the vehicle should be failed for an illuminated MIL or O_2 light. Enter the appropriate code into the EIS.

It is sometimes difficult to know if the vehicle being tested should have a MIL or O_2 light. Make every effort to ensure that the vehicle being tested should have such warning lights before failing the vehicle because the lights do not appear when the ignition is on with engine off.

1985 VW Rabbits, Jettas, and pickups manufactured in the Westmoreland plant will not show a MIL when tested using this procedure. There is no test circuit provided on these vehicles. ON THESE VEHICLES ONLY, if no light shows for either the key-on engine-off or key-on engine-on test modes, enter the code for "Pass" into the EIS.

If the test procedure does not yield a valid test, check either the applicable ECS manual or with the dealer for a valid test procedure. If a vehicle is encountered for which the above test procedure is not applicable, notify the local I/M program.

D. Major Vacuum Leaks: Problems with vacuum lines will sometimes result in a vacuum leak. An indication of a vacuum leak is a hissing sound. Major vacuum leaks may be found in other places besides vacuum hoses. Brake vacuum boosters and intake manifolds are examples. One indication of a major vacuum leak is an unsteady, poor idle condition and an unsteady, high HC reading. If a major vacuum leak is suspected, attempt to quickly verify such leaks by pinching off vacuum hoses supplying vacuum to suspected components or by using a commercially available leak detector. Identify all obvious major vacuum leaks in addition to those associated with vacuum hoses. Enter a "P" into the EIS if a major vacuum leak is not verified or "F" if a major vacuum leak is verified.

E. Positive Crankcase Ventilation (PCV) System: Check to ensure that the system is properly exhausting fumes from the crankcase and that adequate vacuum is present at the valve, metered orifice or other flow control device. This check should be performed by opening the system as near to the valve, metered orifice or other flow control device as practical and checking for adequate vacuum. If the system uses a valve, check to see that it operates freely by shaking the valve or closing and opening the valve and listening for sounds of movement.

Check to see that all hoses are hooked up, routed properly and in good condition and that a system designed to be closed is not open.

Enter a "P" or "F" as appropriate in the EIS.

F. Intake Air Heater (TAC): For vacuum-operated systems, apply vacuum to each vacuum motor using a hand-operated vacuum pump with a gauge. **No other procedure is allowed**. Note if the vacuum motor holds vacuum and if the flapper moves freely from fully closed to fully open and freely returns to the fully at-rest position when vacuum is released. For expanding pellet-operated systems, use either a compressed air-operated "choke checker" or a comparable device that is capable of quickly lowering the temperature of the pellet to the temperature that should cause the TAC to be fully closed and quickly raising the temperature of the pellet to the temperature that should cause the TAC to be fully open. Verify that temperature change does cause the proper result and enter the appropriate code into the EIS.

G. Early Fuel Evaporation (EFE): Local I/M Programs may require an inspection of the bi-metal, spring-operated flapper type found in older vehicles. For these vehicles, check the EFE to ensure that it is in the proper position relative to the temperature of the engine, that it operates freely and that it freely returns to the proper position when rotated manually. Enter the appropriate code into the EIS based upon your inspection.

For vehicles with a vacuum-operated EFE, check the EFE to ensure that it operates freely, that it moves from fully closed (at rest) to fully open when vacuum is applied, that the vacuum motor does not leak and that the flapper freely returns to the closed position when vacuum is removed. Enter the appropriate code into the EIS based upon your inspection.

The requirements for testing electrically heated EFE grids vary between local I/M Programs. Local I/M Programs may require a test for continuity. Test all electrically heated grids with the ignition in the off position. The EIS will prompt you to either:

1. test the EFE grid to manufacturer's specifications regarding the electrical resistance across the grid; or

2. determine if there is electrical continuity to ground through the EFE grid; test the EFE grid according to manufacturer's specifications unless you cannot determine those specifications or have been instructed to only test EFE grids for continuity by the local I/M program office; to test the EFE grid disconnect at the connector closest to the carburetor; connect test leads to the wires attached to the EFE grid; if the EFE grid fails the functional check selected by the local I/M program office (either it fails to meet manufacturer's specifications or electrical continuity to ground cannot be detected), enter a "Fail" into the EIS.

H. Air Injection System (AIS): Check the air injection system for proper operation and perform the following checks:

1. check air pump belt for proper tension;

2. check for leaks or other failures in hoses, tubing, and diverter, gulp, bypass, or other valve or control components; check for leaking relief valve or other pump malfunctions; check to ensure that any air tube is properly connected;

3. test check valves by inspecting the hoses connected to them for cracking or signs of charring or burning; listen and feel for exhaust gases leaking excessively past the check valve; if any sign of damage or leakage is found, disconnect the air delivery hose at the end opposite from the check valve and check for valve pulsation;

4. if the pump is excessively noisy, check for a loose drive belt, seized (or seizing) pump, leaking hoses, improperly routed or pinched hoses, loose pump mounting, or pump damage;

5. check for airflow by removing an output hose or by pinching off a hose by hand and feeling for check valve pulsation;

6. check to ensure that the air is properly routed to the correct destination at the proper time; and

7. some trucks are equipped with two air pumps; most are testable as is; however, some will cause the test to abort due to excessive dilution; if a dilution condition is experienced with a twin air pump vehicle, pinch off one air delivery hose for the duration of the exhaust analysis; this will decrease the oxygen in the exhaust and should render the vehicle testable; this special testing procedure has been approved by the ADEC's I/M office for testing twin air pump vehicles only.

Record a "Fail" under the Air Injection System functional check category if defects are identified during the checks required under this section.

e. Confirm Data Entry for Visual and Functional Inspection: The EIS will display the following prompt at this point in the test:

REVIEW VISUAL AND FUNCTIONAL CHECK ENTRIES FOR ACCURACY. IF THE INFORMATION IS CORRECT, PRESS CONTINUE. IF NOT, MAKE THE NECESSARY CORRECTIONS.

All previous entries will then be displayed and you will be allowed to edit the information. Confirm that previous entries are complete and correct before continuing.

f. Vehicle to EIS Hookup: Select and attach an RPM hookup device from the EIS to the vehicle. The EIS will prompt you to choose the OBDII diagnostic link connector for model year 1996 and newer OBDII equipped vehicles.

g. OBDII Test Procedure: If you are testing a 1996 or newer OBDII equipped vehicle and did not select the OBDII diagnostic link connector in the previous step, the EIS will prompt you to make that hookup now.

Once the OBDII diagnostic link connection is confirmed by the EIS an automatic check of the OBDII system will begin. The OBDII system check includes a readiness evaluation, a malfunction indicator lamp (MIL) status check and a diagnostic trouble code (DTC) check.

There are several monitors used on the OBDII equipped vehicle. Possible vehicle monitors include the following: misfire, fuel system, comprehensive component, catalyst, heated catalyst, evaporative system, secondary air system, air conditioning system, oxygen sensor, oxygen sensor heater, EGR, thermostat and PCV system monitors. Each monitor applicable to the particular vehicle being tested performs self-tests during certain operating modes or driving conditions to ensure that they are functioning properly. When these self-tests have been completed, a readiness code is set to confirm that relevant monitor self-tests have successfully been run. This feature is designed so that when a mechanic scans the OBDII system and sees that all the readiness codes are set, the mechanic can be confident of the validity of any diagnostic trouble codes (DTCs) that may or may not be set. While a non-functioning readiness monitor does not necessarily mean that a vehicle is polluting, it provides no assurance that the OBDII system has fully evaluated the emissions performance of the vehicle or that the absence of DTCs indicates a properly functioning system.

The MIL status is then checked. Is the MIL commanded to be illuminated? A "yes" or "no" status response will be provided to the EIS from the OBDII system computer.

Any DTCs stored in the OBDII system will be sent to the EIS. The EIS will make a "pass," "fail" or "advisory-only" determination based on the results of the OBDII check as well as the model year of the vehicle being tested.

h. Exhaust Emission Standards: The exhaust emission standards that apply to pre-OBDII or vehicles exempt from OBDII testing are set out in 18 AAC 52.050 and illustrated in Figure 5.

Figure 5
Exhaust Emission Standards

Category	Description	CO (Idle)	CO (2500)	HC	CO + CO2	RPM
Cars (LDGV):		%	%	ppm	%	
					Minimum	
01	1968 – 71, > 4 cyl	5.0	4.0	1000	8.0	1100
02	1968 – 71, ≤ 4 cyl	5.0	4.0	1000	7.0	1100
03	1972 – 74	4.0	3.0	1000	8.0	1100
04	1975 – 80	2.0	2.0	1000	8.0	1200
05	1981 – 83	1.0	1.0	1000	7.0	1200
06	1984 – 93	1.0	1.0	750	7.0	1200
07	1994 +	0.5	0.5	220	7.0	1200
Trucks (LDGT 1 and LDGT 2):						
08	1968 – 72, > 4 cyl	5.0	4.0	1000	8.0	1100
09	1968 – 72, 4 cyl	5.0	4.0	1000	7.0	1100
10	1973 – 78	4.0	3.0	1000	8.0	1100
11	1979 – 83	2.0	2.0	1000	7.0	1200
12	1984 – 93	1.0	1.0	750	7.0	1200
13	1994 +	0.5	0.5	220	7.0	1200
Trucks (HDGV):						
14	1968 – 73, All	5.0	5.0	1000	8.0	1100
15	1974 – 78, All	4.0	4.0	1000	8.0	1100
16	1979 – 93, All	4.0	4.0	1000	8.0	1100
17	1994 +, All	1.0	1.0	220	8.0	1100

LDGV	light-duty gasoline-fueled vehicles (passenger cars) not exceeding 8500 lbs. GVWR.
LDGV1	light-duty gasoline-fueled trucks not exceeding 6000 lbs. GVWR (lighter pick-up trucks and vans).
LDGT2	light-duty gasoline-fueled trucks over 6000 lbs. GVWR and not exceeding 8500 lbs. GVWR (heavier pick-up trucks and vans, and many commercial trucks).
HDGV	heavy-duty gasoline-fueled vehicles over 8500 lbs. GVWR (heavier commercial trucks, buses and motorhomes).

i. Perform the Emissions Measurement Test:

1. General Procedures: The EIS will instruct you to make sure the exhaust sample probe is not inserted in a vehicle tailpipe and will then automatically perform a "hang-up" check to determine whether the sample lines or filters may be contaminated with any liquid hydrocarbons.

If no hydrocarbons are detected in the sample line, you will be prompted to start the engine, insert the exhaust probe and perform the appropriate test sequence, as prompted. The different test sequences are designed to make the test procedure correlate better with the Federal Test Procedure. Most of the different test sequences are designed to prevent incorrectly failing "pattern failure" vehicles. Additional test sequences may be added in EIS software updates.

WARNING: The following procedure could result in transmission damage to 1984-87 BMWs, 1983-88 Volvo 740s, and 1986-92 Peugeot 505s equipped with ZF automatic transmissions. Because of the possibility of transmission damage to these vehicles, it is recommended that they be tested at their dealership. If such a vehicle is tested, do NOT warm the engine by raising the engine above idle while the transmission is in park or neutral.

The EIS will automatically select the proper test sequence for each vehicle being tested. Follow the instructions for each test sequence after making sure that accessories such as the air conditioner and rear window defogger are turned off and after ensuring that the engine is warmed up.

To ensure that the engine is warm:

A. check for warmth in the coolant hoses between the radiator and the engine, or check an engine or oil temperature gauge;

B. raise engine RPM above the 2500 RPM window for 30 seconds; and

C. slowly bring the RPM down to the 2500 RPM window and perform the tailpipe test.

> **NOTE**: It has been determined that having a vehicle in "drive" during an idle warm-up period or testing a vehicle in drive or in gear in the high idle or idle RPM window preconditions the computer in some vehicles. This could allow the vehicle to pass the tailpipe emissions test with defective components. This practice is a violation of the I/M program unless specifically required by the EIS.

2. Outside Testing: The EIS is designed for use in a shop environment, not for testing outside. However, some certified stations may wish to test vehicles outside. To accommodate these stations, while at the same time not compromising the data collected, the following procedures are allowed from May 1 to September 30:

   A. The EIS must stay inside the building out of direct sunlight.

   B. The vehicle may be outside the shop only if an exhaust hose is on the tailpipe end and coiled to prevent air from blowing up the tailpipe.

   C. All EIS specifications must be maintained. This includes an exhaust probe hose length no greater then 30 feet.

   EIS owners are responsible for any invalidation of the EIS warranty and are liable for necessary repairs.

3. Testing Dual-Exhaust Vehicles: Testing vehicles with dual exhausts is accomplished by using a dual probe attachment on the EIS. Dual probe attachments are available from the EIS vendors. A certified station must have a dual probe attachment for the EIS.

4. Emissions Test: The first stage of the Idle Mode Test is the high RPM test. The vehicle needs to run at between 2250 and 2750 RPM for 30 seconds to complete this portion of the test. The EIS will display a message if the RPM is unstable. The EIS will not begin the exhaust analysis until the probe sample flow is adequate, exhaust dilution is not present and the sample system has been purged of excess hydrocarbons.

j. Aborted Tests - NOTE: Except as provided in 2. of this section (Customer-Requested Tests), the motorist may not be charged a fee for the aborted test. Repair costs cannot be counted toward the repair cost minimum until there is a completed initial (failed) test:

1. Abort message: Exceeding or not reaching the RPM limits, not reaching the dilution threshold or experiencing a low flow rate will automatically cause the testing period to restart for that mode. If it is not possible to maintain the proper speed range, the test will have to be aborted and repairs performed before re-attempting I/M testing.

After completing the high RPM test, the EIS will display a message to reduce the RPM for the idle or low RPM portion of the test. For the test results to be valid, the idle RPM must not be too high. Excessive idle RPM speed can cover up emission problems. The EIS will display a message indicating whether the idle speed is too high. The idle speed must be lowered before the test may continue. It is permissible to lower the idle speed by turning on the vehicle accessories such as headlights, radio, rear window defogger and air conditioner or the idle speed may be adjusted using the

manufacturer's recommended procedures. It is not permissible to test a vehicle in gear

unless prompted to do so by the EIS. If the idle speed cannot be lowered enough, the test will have to be aborted and repairs performed before re-attempting I/M testing.

Other examples of test abort conditions include vehicle safety problems that occur during a test like a fuel or coolant leak.

2. Customer-Requested Tests: A customer who wants an I/M test for a vehicle that does not require a certificate of inspection may receive an I/M test on request. If no certificate is issued for the vehicle, use the abort code #13 ("Vehicle Does Not Require Inspection") to abort the test prior to the certificate of inspection issue screen on the EIS. **A customer-requested test described in this paragraph is the only time a customer may be charged for an aborted I/M test.**

3. After-Repair Checks: ADEC's I/M Office recommends that CO repairs, particularly referee-required repairs, be checked. ADEC's I/M Office recommends that the check be made by running an I/M test up to the last chance to abort which is prior to a final pass/fail determination being made. The test should be performed in the I/M mode rather than the manual (tune-up) mode, since the EIS uses different emission sampling protocols in the two modes. Use "Vehicle Does Not Require Inspection" (#13) for the abort code. The customer must not be charged for this procedure.

4. Sample Dilution: Sample dilution is a frequent cause of an aborted test, which occurs when the EIS detects that there is not enough carbon monoxide (CO) and carbon dioxide (CO_2) in the exhaust gases. CO is a product of incomplete combustion and CO_2 is a product of complete combustion. If neither are present in sufficient quantity, it indicates to the EIS that there is either no combustion or that the actual exhaust gases are not being tested.

If an EIS indicates sample dilution, one or more of the following items may be the cause:

   * loose fittings on the EIS probe,
   * leaking gaskets on the EIS filter bowls,
   * filters loose in their mounts,
   * O-rings improperly installed or missing,
   * too lean an air-fuel mixture, or
   * a leaking exhaust system.

If the vehicle being tested shows no indication of a leaking exhaust system and dilution is present, a leak test should be performed on the EIS immediately. All vehicles showing excessive dilution must be referred to the referee facility unless an obvious exhaust leak is present. Exhaust leaks that cause an abort condition must be repaired before an I/M test and the cost of the repair is not counted toward the cost minimum. During the exhaust analysis all data entry and command keys become deactivated except the Abort/Escape key. Test results will not be displayed during the test, only a message indicating the remaining time on a test and the word "TESTING."

k. Test Sequence: The EIS will automatically select one of the test sequences listed below:

1. Test Sequence No. 1: This test sequence is used to test all vehicles except those mentioned under the other test sequences described in this subsection.

Testing period: **30 seconds for each stage.**

First stage: **2500 RPM (+/- 10%).**

Second stage: **Idle RPM.**

Basis for test results: Average of last 5 seconds of each sampling period.

2. Test Sequence No. 2: This test sequence is used to test all 1981-84 Ford passenger cars with 5.8 liter (351CID) engines. Before beginning the test, you will be informed that the vehicle being tested will require special test procedures. You will then be prompted to turn the key off for 10 seconds. After 10 seconds, the EIS will prompt you to restart the engine and begin the 2500 RPM test.

Testing period: **30 seconds for each stage.**

First stage: **2500 RPM (+/- 10%).**

Between the test stages, you will be prompted to turn the ignition off for 10 seconds. After 10 seconds, the EIS will prompt you to restart the engine and begin the idle test.

Second stage: **Idle RPM.**

Basis for test results: After the first 15 seconds of each stage, any passing reading (averaged over 5 consecutive seconds) collected during each sampling period or, if none, over the last 5 seconds.

Test sequence No. 2 could take as little as 20 seconds if test conditions are satisfied and the vehicle meets the emission standards.

3. Test Sequence No. 3: This test sequence is used to test all 1984 Jeeps with a 2.5 liter (150 CID) engine.

Testing period: **30 seconds for each stage.**

Before the 2500 RPM test starts, the EIS will display a message indicating that the engine RPM cannot exceed 2650 for this vehicle.

First stage: **2500 RPM (+ 6%, - 10%)**

Second Stage: **Idle RPM**

Basis for test results: Average of last 5 seconds of each sampling period.

4. Test Sequence No. 4: This test sequence is used to test all 1984
Chrysler/Dodge/Plymouth passenger cars equipped with a 2.2 liter, fuel injected engine
and an automatic transmission.

Testing period: **30 seconds for each stage.**

First stage: **2500 RPM (+/- 10%).**

A message will be displayed indicating that the vehicle will require special test
procedures. You will be prompted to set the parking brake, press the brake pedal and
run the idle test with the transmission in drive.

Second stage: **Idle RPM.**

Basis for test results: Average of last 5 seconds of each sampling period.

5. Test Sequence No. 5: This test sequence is used to test all 1984-87 BMWs, 1983-88
Volvo 740 and 1986-92 Peugeot 505 models with automatic transmissions. When you
enter the vehicle and transmission information for these vehicles, the EIS will display
the following message:

BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, IT
IS RECOMMENDED THAT IT BE TESTED AT ITS DEALERSHIP. IF YOU STILL WISH
TO PERFORM THE I/M TEST, YOU MAY DO SO AT YOUR OWN RISK. PRESS ENTER
TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST. (ENTER ABORT CODE
14).

If you choose to continue the I/M test on this vehicle, the following message will be
displayed before beginning the test sequence:

BEFORE BEGINNING THE EMISSION TEST, MAKE SURE THE ENGINE IS AT
NORMAL OPERATING TEMPERATURE. IF NOT, THE VEHICLE SHOULD BE DRIVEN
UNTIL IT IS. DO NOT WARM THE ENGINE BY RAISING THE ENGINE ABOVE IDLE
WHILE THE TRANSMISSION IS IN PARK OR NEUTRAL.

AFTER THE ENGINE REACHES NORMAL OPERATING TEMPERATURE, PUT THE
TRANSMISSION IN PARK AND TURN THE ENGINE OFF FOR 30 SECONDS.
RESTART THE ENGINE. AFTER THE ENGINE IS STARTED, DO NOT MOVE THE
GEAR SHIFT SELECTOR THROUGH THE FORWARD OR REVERSE GEARS BEFORE
OR DURING THE SEQUENCE. DO NOT EXCEED 2000 RPM**.**

The following test sequence will then be used to test the vehicle:

Testing period: **30 seconds for idle stage.**

First stage: **Perform idle test only (delete first stage).**

Second stage: **Idle RPM (Note: One stage only).**

Basis for test results: Average of last 5 seconds of the sampling period.

6. Test Sequence No. 6: This test sequence is used to test all 1985 Ford Ranger 2.3 Liter (140 CID) light-duty trucks and 1986 Ford Ranger and Aerostar 2.3 Liter (140 CID) light-duty trucks.

Testing period: **30 seconds for each stage.**

First stage: **2500 RPM (+/- 10%).**

Basis for test results: Average of last 5 seconds of each sampling period.

Second stage: **Idle RPM.**

Basis for test results: Same as stage 1; however, if the emissions are not within the standards and the idle RPM was below 900, you will be prompted to increase the idle RPM to 900+ and to perform another 30-second idle test. After the first 15 seconds of the repeated idle test, any passing reading averaged over 5 consecutive seconds collected during the sampling period or, if none, the average reading over the last 5 seconds of the stage.

7. Test Sequence No. 7: This test sequence is used to test all 1985 - 1986 GM passenger cars with 5.0 liter and VIN-Y ("Y" in eighth position of the VIN) engines.

Testing period: **30 seconds for each stage.**

First stage: **2500 RPM (+/- 10%).**

Second stage: **Idle RPM.**

You will be prompted to start the vehicle and allow it to idle. At the end of 156 seconds, the EIS will prompt you to insert the probe and begin the 2500 RPM test.

l. Second Chance Test: If a vehicle that has passed the visual inspection and the functional tests fails the emission test, the EIS will instruct you to precondition the vehicle and run a "second chance" exhaust analysis. These vehicles must be preconditioned using the applicable procedure described in this section and retested.

NOTE: Vehicles that fail the visual inspection due to missing, modified or disconnected emission control systems should not be preconditioned and retested, because they will require repairs to be performed regardless of the emissions test results.

The preconditioning period will begin when the RPM is stable and within the proper range. Engine speed and time remaining will be displayed during the preconditioning period. The applicable preconditioning procedure and the applicable special test sequence will be combined by the EIS so that multiple test sequences are not used.

1. Preconditioning Procedures: The EIS will automatically select one of the preconditioning sequences listed in this subsection:

   A. Preconditioning Procedure No. 1: This procedure is used to precondition all vehicles not covered by procedures No. 2 or 3. The EIS will prompt you to remove the exhaust probe, ensure that the transmission is in Park or Neutral, increase the engine RPM to between 2500 and 2800 and maintain this RPM for 3 minutes. You will be prompted to adjust the RPM, restart the preconditioning, or abort the I/M test as appropriate if the RPM is outside the specified limits. You will then return the engine to idle RPM and allow the engine to stabilize for 10 seconds. **Do not turn off the ignition**. Insert the probe and continue with the exhaust analysis. The exhaust analysis will proceed when the RPM reaches the required value. The EIS will display the time remaining before the preconditioning period will have to be restarted or the test aborted.

   B. Preconditioning Procedure No. 2: This procedure is used to precondition all 1981-86 Fords and 1984-85 Honda Preludes. The EIS will prompt you to remove the exhaust probe, ensure that the transmission is either in Park or Neutral position and increase the engine RPM to between 2500 and 2800 and maintain this RPM for 3 minutes. You will be prompted to adjust the RPM, restart the preconditioning or abort the I/M test as appropriate if the RPM is outside the specified limits. You will then return the engine to idle RPM, turn off the ignition for 10 seconds, restart the engine, insert the probe and continue with the exhaust analysis. The exhaust analysis will proceed when the RPM reaches the required value. The EIS will display the time remaining before the preconditioning period will have to be restarted or the test aborted.

   C. Preconditioning Procedure No. 3: This procedure is used to precondition 1984-87 BMWs with automatic transmissions and 1986-92 Peugeot 505 and 1985-88 Volvo 740 models with automatic transmissions. When you enter the vehicle and transmission information for these vehicles, the EIS will display the following message:

   BECAUSE OF THE POSSIBILITY OF TRANSMISSION DAMAGE TO THIS VEHICLE, IT IS RECOMMENDED THAT IT BE TESTED AT ITS DEALERSHIP. IF YOU STILL WISH TO PERFORM THE I/M TEST, YOU MAY DO SO AT YOUR OWN RISK. PRESS ENTER TO CONTINUE. IF NOT, PRESS "ESC" TO ABORT THE TEST. (ENTER ABORT CODE 14).

If you choose to continue the I/M test on this vehicle, the following message will be displayed:

DUE TO POSSIBLE SERIOUS TRANSMISION DAMAGE, DO NOT RAISE THE ENGINE SPEED ABOVE IDLE RPM WHILE THE TRANSMISSION IS IN NEUTRAL OR PARK. IF THE VEHICLE NEEDS TO BE PRECONDITIONED, DRIVE IT UNTIL IT HAS REACHED OPERATING TEMPERATURE.

2. Repair Action Categories: On all "A" tests, you are required to enter information regarding repairs made to reduce emissions. The EIS will display the major repair categories (listed in Figure 6) first. It also shows the prompt that will accompany the display of repair categories.

Enter a "Y" for each item repaired or enter a "W" if the repair performed was covered by a manufacturer's warranty. For all "A" tests, at least one valid entry must be made indicating repairs were performed or the test type must be changed to "I". A zero repair cost may be entered. Tell the motorist that this section is used to show information regarding the repairs actually performed on a vehicle.

Figure 6

REPAIR ACTION CATEGORIES

DISPLAY PROMPT:

SELECT THE APPROPRIATE VEHICLE SYSTEM IN WHICH A REPAIR WAS PERFORMED. ENTER "Y" FOR EACH SYSTEM THAT INCLUDED A REPAIR, PART REPLACEMENT OR ADJUSTMENT. ENTER "W" FOR REPAIRS THAT HAVE BEEN COVERED BY A MANUFACTURER'S WARRANTY.

VEHICLE SYSTEMS

EGR SYSTEM
ELECTRICAL/ELECTRONIC SYSTEM
EVAPORATIVE CONTROL SYSTEM
EXHAUST SYSTEM
IGNITION SYSTEM
INTAKE/FUEL INDUCTION SYSTEM
INTERNAL ENGINE
PCV SYSTEM
OTHER

3. Parts and Labor Cost: After the list of repairs, there will be a section of the VIR that lists the cost of the repairs performed. The cost of the inspection itself and the certificate of inspection are not to be included. A typical example is shown in Figure 7. (In the example, the vehicle received emissions repairs costing $95 that were not covered by a manufacturer's warranty. The Total Emissions Repairs Estimate was also $95, because all the required repairs were performed.) Round amounts to the nearest whole dollar; **do not include cents.**

Figure 7

VIR Repair Cost Section

Total Cost of Parts and Labor $95

Enter the costs for parts and labor. The prompt for repair cost entry is shown below.

ENTER THE COST TO THE MOTORIST FOR PARTS AND LABOR COMBINED. ROUND TO THE NEAREST DOLLAR AMOUNT. IF THERE WAS NO CHARGE FOR THE PARTS OR LABOR, ENTER 0. IF REPAIRS WERE PERFORMED UNDER AN EMISSIONS WARRANTY, ENTER 0.

If the total emission repair estimate exceeds the cost minimum, refer the vehicle to the referee facility before any I/M repairs are performed. The referee facility will decide what repairs are to be performed.

m. How to Proceed on Test Results: The EIS will evaluate the information entered and the emission results, and will determine whether the vehicle passes the inspection ortest. If a 1975 model-year or newer vehicle passes the visual and functional checks and the emissions test, a certificate of inspection may be issued. If a 1968 through 1974 model-year vehicle passes the emissions test, a certificate of inspection may be issued. Beginning on January 1, 2001, 1996 and newer model year vehicles must pass the OBDII portion of the test, while tailpipe emissions testing may not be required.

NOTE: Any discrepancy in the information printed onto a certificate of inspection must be reported to the local I/M program office before the certificate is issued and further I/M tests may not be performed using that EIS until the discrepancy is corrected.

1974 and older models that fail the emissions test and 1975 and newer models that fail any of the visual and functional checks or the emissions test will not receive a certificate of inspection and will have to be repaired and retested.

If repairs are required, the motorist must be informed that they may be performed by anyone. Repairs may not be made at any certified station that lacks special tools, equipment, or replace-ment parts required to repair the vehicle properly. A partial repair of an ECS may not be performed. An example of a partial repair is a repair in which the mechanic finds that a vehicle's

air injection system is missing a drive belt, an air distribution manifold and a check valve, but replaces only the drive belt. A complete repair would require the installation of all three missing parts since all three are needed for the vehicle to pass a reinspection of the air injection system. Repair of an ECS may not begin until all required parts are present.

> All applicable procedures described in this Part must be used by certified mechanics when performing emissions repair work. Deviation from these procedures is grounds for suspension or revocation under 18 AAC 52 of certification of both the mechanic and the facility that employs the mechanic.

A person authorized to perform repairs under a manufacturer's warranty must first determine whether emission repairs are covered by warranties provided by the manufacturer. A federally required 2 yr/24,000 mile parts warranty covers defects in any emission control device or system (such as an oxygen sensor) installed for the sole or primary purpose of reducing vehicle emissions. In addition, a specified major emission control component warranty covers catalytic converters, powertrain control modules (PCMs) and onboard emissions diagnostic (OBDII) computers for 8 years or 80,000 miles.

> Under 18 AAC 52.105(b) and 18 AAC 52.515(j), it is a violation of these procedures for a person authorized to perform repairs under these emission warranties to charge for the repair of defects covered by the warranty unless the motorist requests that the repair be made at a facility other than an authorized warranty repair facility.

n. Previous Sticker Entry: If there is a sticker on the vehicle from a previous I/M test the EIS will prompt you to scan or manually enter the number from it.

o. Sticker Number Verification: The EIS will display the next sticker number on the screen and ask you to confirm this number. If you confirm this number, the EIS will proceed to printing the certificate (sticker). If you cannot confirm the sticker number displayed as the next sticker available, the EIS will display this prompt:

> (1) RECORD A VOIDED OR DAMAGED STICKER
>
> (2) RECORD A MISSING OR STOLEN STICKER.

If you enter a "2" indicating that the sticker is missing or stolen, this message will be displayed:

> RECORD THE NUMBER OF THE MISSING/STOLEN STICKER FOR AUDIT PURPOSES. IMMEDIATELY REPORT ANY MISSING OR STOLEN STICKERS TO YOUR LOCAL I/M PROGRAM OFFICE AND REQUEST A NOTIFICATION REPORT FORM. ENTER THE MISSING OR STOLEN STICKER NUMBER.

All stickers are the responsibility of the station that purchased them and must be accounted for at all times.

p. Certificate (Sticker) Printing: The EIS will ask you to verify that the certificate (sticker) has printed properly. If it has not printed properly, the EIS will allow you to correct the printer problem before attempting to print again.

q. Affixing the Sticker: If there is a previous I/M sticker on the vehicle, you will have to remove it prior to affixing the current sticker to the vehicle. You also need to affix a validation sticker to the Vehicle Inspection Report (VIR). If the sticker is damaged during this process, retain the damaged sticker for audit purposes, go to the next sticker number in your inventory and return to "Sticker Number Verification" on the EIS. The EIS will provide prompts to get you through this process.

r. Vehicle Inspection Report (VIR) Interpretation: Point out to the motorist each section of the VIR, describing the type of information it contains and explaining the content. It is the responsibility of the certified station and the mechanic who performed the inspection to ensure that the VIR is properly explained.

1. Copy Distribution; General Information: The VIR must be given to the motorist after the inspection. In addition, the station that performs the inspection must give the motorist either a certificate of inspection or a written, itemized estimate of repairs. Before repair of the vehicle, a certified mechanic must review the VIR and estimate of repairs. The motorist must be made aware of any applicable repair cost minimum.

2. Rejected Vehicles: A VIR will not be printed for a vehicle rejected from testing because of defects that prevent safe testing, as described in 18 AAC 52.530(d). The condition that caused rejection must be repaired before a vehicle can be tested. The cost minimum does not apply to rejected vehicles. In addition, the cost of repairs necessary to correct a rejected vehicle does not count toward the repair cost minimum.

3. Overall Test Results: The VIR will contain a summary of the overall test results for the vehicle tested. The OVERALL TEST RESULTS area on the VIR will display the word "PASSED" or "FAILED." If the word "PASSED" appears, no repairs are required. If the word "FAILED" appears, the vehicle has failed the visual or functional checks, the OBDII check, or the emission test and repairs are required before the vehicle may receive a certificate of inspection.

   A. Vehicles PASSING the Initial Test: For vehicles that pass the I/M test, the EIS will print a VIR and a certificate of inspection. The VIR must be signed by the mechanic who performed the test. By signing the VIR, you are certifying that the test and any I/M or emissions-related repairs were properly performed. Attach the small sticker printed by the EIS to the VIR for validation, and the larger sticker

(the certificate of inspection) to the lower left interior side of the windshield of the vehicle.

If the vehicle passes an "I" test, the motorist is also to be given a copy of the VIR. Figure 8 shows a typical example of the OVERALL TEST RESULT section of a VIR issued to a vehicle that passed its initial test.

Figure 8
VIR Overall Test Results

VEHICLE INSPECTION REPORT

OVERALL TEST RESULT: PASS

Visual: **PASS**   Functional: **PASS**   Tailpipe Emissions: **PASS**

NOTE: Any discrepancy in the information printed onto a certificate of inspection must be reported to the local I/M program office before the certificate is issued and further tests may not be performed using that EIS until the discrepancy is corrected.

Until August 31, 2002, you should advise the motorist to keep the VIR in the vehicle and to take or mail the certificate of inspection to DMV along with the registration renewal notice for the vehicle. Beginning on September 1, 2002, the paper part of the certificate of inspection will no longer be printed. The motorist may also call the local DMV office or re-register the vehicle with DMV via the Internet. For initial vehicle registration, the motorist should take the VIR into any DMV office. You should advise the motorist that this is the section of the VIR that shows if the vehicle passed or failed the I/M test. The certified station and the mechanic who performed the inspection are also responsible for explaining the additional information contained on the VIR to each motorist whose vehicle is tested. For passing vehicles, the VIR also contains a short congratulatory message.

   B. Vehicles FAILING the Initial Test: If a vehicle fails an "I" test,

         i. the motorist must be told that

              a.   repairs must be made before the vehicle can pass the test and a certificate of inspection can be issued so that the vehicle registration can be renewed by DMV;

              b.   repairs may be performed by anyone, but if the vehicle is not repaired by a certified mechanic at a certified station, the cost minimum does not apply to those repairs; any additional repairs that are required must be made; and

              c.   repairs performed at a certified station may not exceed the repair cost

        minimum; if the vehicle fails after the certified station makes required repairs up to the repair cost minimum, the motorist will be referred to the referee facility.

    ii. The motorist must be given a written, itemized estimate of repairs and be told that there is no charge for the "A" test if the repairs are performed at the station that performed the "I" test. The station and the mechanic who performed the inspection are also responsible for explaining the additional information contained on the VIR to each motorist whose vehicle is tested.

       Certified mechanics and stations may not perform any repairs on a vehicle that cannot be repaired to pass the I/M test for the cost minimum applicable to the vehicle, except in one of the following cases:

    1) the motorist presents a referee facility required repair form; or

    2) after being informed in writing of the amount required to be spent within the terms of the cost minimum, the motorist provides written authorization to the station to repair the vehicle to pass the I/M test.

4. Referee Facility Referrals: Occasionally, a customer may disagree with the results of an I/M test. Some customers may also believe that repair work was not done properly. Station employees should attempt to resolve customer complaints.

If a customer believes a vehicle was improperly failed, you should review the VIR with the customer. Point out the areas where the vehicle has problems. Explain to the customer that a vehicle can have excessive pollution levels even though it seems to be running properly. Point out that defects that make the vehicle run too rich are also reducing fuel economy. Such defects include, but are not limited to, improperly adjusted idle mixture, stuck chokes, defective oxygen sensors and defective electronic engine controls. If the customer objects to this, refer the vehicle to the referee facility.

If the customer complains about the diagnosis of required repairs, you should explain why the repairs are necessary and tell the customer that the repair work is guaranteed. You should tell the customer that the vehicle may be taken to another facility for the repair work (or for a second opinion), but that another test fee is required in such a case. If the customer objects to this, refer the vehicle to the referee facility.

If the customer believes that a repair was improper, you should explain why it was done. If the customer is still not satisfied, you should tell the customer to call the local I/M program office. You should not tell the customer that the referee facility will test any vehicle when a customer has complaints.

5. Referee-Required Repairs: If all of the required parts cannot be procured, call the TECHLINE before proceeding.

The referee facility may approve some repairs over the telephone. If that happens, you should document on the referee-required repair form the date, time, authorization number and the name of the person authorizing the repair.

There is no need to perform an "I" test on a vehicle with referee-required repairs. The responsibility of the certified station is to properly perform the repairs as outlined on the required repair form, if all required parts are present and the cost will not exceed the cost minimum.

ADEC's I/M office recommends that the repairs be checked. If this involves a tailpipe emissions test, ADEC's I/M office recommends that the check be made by running an "I" test up to the point of the analyzer prompt for the final chance to abort, before aborting the test. Use "Vehicle does not Require Inspection" (code #13) for the abort code.

The certified station will be authorized by the referee to issue a certificate of inspection for the vehicle or will be instructed to tell the customer to call the referee facility for an appointment for reinspection of the vehicle and issuance of the certificate of inspection.

Referee facility required-repair forms for vehicles with engine changes will include the engine year and size.

A certificate of inspection can be issued to a failing vehicle that was repaired to meet the repair cost minimum by a certified station if 1) the repairs were properly performed as required by a referee facility required repair form and 2) the repairs did not cause emissions to increase. This certificate of inspection may only be issued by the referee facility, and you must ask the motorist to return to the referee facility for the certificate. Until August 31, 2002, the motorist should be told to take or mail the certificate to DMV with the registration renewal notice for the vehicle. Beginning on September 1, 2002, you should advise the motorist to keep the VIR in the vehicle, although this is not mandatory, and to call the local DMV office or re-register the vehicle with DMV via the Internet. For initial vehicle registration, the motorist should take the VIR into any DMV office. The certified station and the mechanic who performed the inspection are also responsible for explaining the additional information contained on the VIR to each motorist whose vehicle is tested.

6. Explaining the VIR to the motorist: You must clearly explain the information contained on the VIR to the motorist.

   A. Vehicle Information: Advise the motorist that the VEHICLE INFORMATION area of the VIR provides all of the information necessary to determine whether the vehicle being repaired is the same vehicle for which the VIR was issued. An example of a completed VEHICLE INFORMATION area is shown in Figure 9. This example shows that the vehicle tested was a 1977 model-year Ford. This vehicle had a license plate number "4920AN." The vehicle was a medium-duty

truck, with a gross vehicle weight rating of 6,050 pounds. It had a 300 cubic inch displacement six-cylinder engine and was certified under federal (rather than California) emission standards.

Figure 9
VIR Vehicle Information Section

VEHICLE INFORMATION

Year:	**1977**	Make:	**Ford**	Model:	**F150**
VIN:	**F15BL088544**	Engine Size:	**300 CID**	Cylinders:	**6**
License:	**4920AN**	GVWR:	**6050**	Vehicle Type:	**PICKUP**
Odometer:	**85336**	Cert. Type:	**Federal**	Fuel Type:	**Gasoline**
Test Type:	**Initial**			Transmission:	**Manual**

B. Emission Control Systems Underhood Inspection: If "MISSING, DISCONNECTED, DEFECTIVE OR MODIFIED EMISSION CONTROL EQUIPMENT" or "EMISSION CONTROL SYSTEMS NOT OPERATING PROPERLY" is printed below the OVERALL TEST RESULTS section of the VIR, the reason(s) the vehicle did not pass the I/M test will be printed in the VISUAL INSPECTION RESULTS or FUNCTIONAL TEST RESULTS sections of the VIR. A typical example of this section is shown in Figure 10. The defective system must be pointed out to the motorist. Please note that "P" = Pass, "D" = Disconnected, "M" = Modified, "S" = Missing, "F" = Defective and "N" = Not Applicable.

Figure 10
VIR Visual Inspection and Functional Test Results Sections

VISUAL INSPECTION RESULTS

OXYGEN SENSOR	F
VACUUM HOSES AND WIRES	P
POSITIVE CRANKCASE VENTILATION (PCV)	M
EXHAUST GAS RECIRCULATION (EGR)	P
CARBURETOR OR FUEL INJECTION	P
MANIFOLDS AND IGNITION	P
INTAKE AIR HEATER (TAC)	S
EARLY FUEL EVAPORATION (EFE)	P
FUEL EVAPORATIVE CONTROLS (EVAP)	P
AIR INJECTION SYSTEM (AIS)	D
CATALYTIC CONVERTER (CAT)	S
OTHER EMISSION RELATED COMPONENTS	N
MALFUNCTION INDICATOR LAMP	P

FUNCTIONAL TEST RESULTS

EMISSION CONTROL MAINTENANCE	
LIGHT/INDICATOR	P
MALFUNCTION INDICATOR LAMP/CHECK	P
ENGINE LIGHT	P
MAJOR VACUUM LEAKS	P
POSITIVE CRANKCASE VENTILATION (PCV)	F
INTAKE AIR HEATER (TAC)	F
EARLY FUEL EVAPORATION (EFE)	P
AIR INJECTION SYSTEM (AIS)	F

C. Tailpipe Emission Inspection Results: If "EXCESSIVE TAILPIPE EMISSIONS" is listed under the OVERALL TEST RESULT area of the VIR, you should explain to the motorist that the OVERALL TEST RESULT section of the VIR shows the results of the exhaust analysis and that the vehicle may contain defects other than those that are listed in the VISUAL INSPECTION RESULTS, FUNCTIONAL TEST RESULTS and OBDII results area.

Advise the motorist that the TAILPIPE EMISSIONS INSPECTION section on the VIR indicates how the emission levels of the vehicle compare to the standards set for the I/M program and that the information contained in this area provides one indication of emissions problems. On vehicles that failed a visual inspection, functional test or OBDII check but passed the exhaust emissions test, point out that the vehicle may still have serious emission problems even though the high idle and idle emission levels are below the standards. Vehicles with disconnected or defective ECS may have low emissions under these "no load" test conditions but very high emissions in actual driving.

Figure 11 is an example of a printout of this section for a vehicle with exhaust emissions below the standard at 2500 rpm but more than four times the standard at idle.

Figure 11
VIR Tailpipe Emissions Inspection Results Section

TAILPIPE EMISSIONS INSPECTION

	HC ppm			CO%			CO2%	O2%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	1000	366	PASS	1.0	4.6	FAIL	11.0	0.7	669
2500rpm	1000	155	PASS	1.0	0.05	PASS	13.0	2.6	2530

D. Reasons for Failure: Directly below the OVERALL TEST RESULT portion of the VIR, is a general statement describing the reason(s) a vehicle may have failed the inspection. Figure 12 shows the statement printed on the VIR for a vehicle that failed one or more visual inspections, one or more functional checks, the OBDII check or the tailpipe emissions test.

Figure 12

Your vehicle failed the inspection because of missing, disconnected, defective or modified emission control equipment. For further information or assistance, please contact the referee facility.

E. Warranty Message (for applicable vehicles): There is a brief warranty notification printed on the VIR for vehicles that fail the inspection. This is a general statement of warranty coverage and may or may not apply to the vehicle you have just inspected. Figure 13 shows the warranty statement that appears on the VIR for failing vehicles. Advise the motorist that some vehicle components may be covered by a manufacturer's warranty if the vehicle is within the 8 years or 80,000 mile limits and refer the motorist to the authorized dealer for that determination.

Figure 13

Please check with your authorized dealer for emission control warranty details. All vehicles that may be eligible for warranty repair must be referred to the Authorized Dealer.
Vehicles with disconnected, modified, or missing emissions control devices require repair, regardless of cost.
Only those repairs made by a certified I/M mechanic, after an initial inspection is performed, will be considered for a repair cost waiver. If you need additional assistance, contact the local I/M program office.

F. Repairs Performed: This area of the VIR shows information regarding the repairs performed on a vehicle for an "after-repairs" test. After the list of possible repair categories, there will be a portion of the VIR that lists the cost of all of the repairs performed. (The cost of the inspection itself is not included.)

G. VIR - Mechanic Information Section: The statement shown in Figure 14 will be printed at the bottom of each VIR if the vehicle that passes the I/M inspection. You must sign this section of the VIR, below a statement certifying that the vehicle described on the VIR has been inspected in accordance with all I/M program requirements and that the information listed on the VIR is true and correct.

<div align="center">

Figure 14

</div>

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature
    I/M Mechanic Name: XXXXXXXX Y. ZZZZZZZ
    I/M Mechanic ID: XXXXXXXX

For vehicles that fail the I/M inspection, the following message in Figure 15 will be printed:

<div align="center">

Figure 15

</div>

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; and (2) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature
    I/M Mechanic Name: XXXXXXXX Y. ZZZZZZZ
    I/M Mechanic ID: XXXXXXXX

The mechanic who performed the "A" test is responsible for ensuring that the correct repairs were properly completed. If the mechanic who performs the "A" test did not perform the I/M repairs, ADEC's I/M office recommends that the name or certification number of the mechanic who performed the repairs also be included on the VIR.

H. Station Information: This portion of the VIR includes the certificate (I/M station license) numbers of the certified station where the inspection was performed as well as the analyzer number and the software version currently in use. The station name, address and phone number are also printed here.

Figure 16 provides an example of this section of the VIR

Figure 16

VIR Station Information Section

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	**Station Phone:**	907-459-1005
Station Address:	3175 Peger Road	**Station Number:**	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	**Software Version:**	1.00

I. VIR Continuation Page: A second page of the VIR will be printed by the EIS for advisory notices to the motorist. An advisory may be issued if:

(i) the vehicle fails the OBDII portion of the I/M test but the EIS determines that the vehicle is not subject to an I/M test failure for OBDII;

(ii) the vehicle fails the OBDII portion of the I/M test which results in an overall I/M test failure;

(iii) the vehicle aborts due to an incomplete OBDII readiness evaluation;

(iv) the vehicle receives a referee override;

(v) there is no VID contact during the test; or

(vi) the vehicle passes the I/M test but a problem is noted with the vehicle during the test (*i.e.,* a maintenance light is on but is not cause for failure).

s. Prepare Cost Estimate - **NOTE:** The preparation of the cost estimate is the only part of the

inspection that a station employee other than the certified mechanic is allowed to perform. All questions should be referred to the certified mechanic who performed the I/M test. Additional requirements regarding repair cost estimates are set out at 18 AAC 52.515. An itemized estimate of repairs must show a separate charge for parts and for labor for each repair required and indicate to the customer which repairs are necessary to meet the cost minimum. A customer should be given adequate information to be able to make an informed decision as to the difference in cost of repairs necessary to receive a certificate of inspection if 1) the repairs are performed by a certified station, where the cost minimum is used, or 2) the customer performs the repairs and the vehicle must be repaired to pass the I/M test without benefit of the cost minimum.

1. Step 1 - Vehicle Failed Elsewhere: Repair cost estimates must always be based on the information obtained during an I/M test performed by the certified station that will be doing the repairs. When a vehicle is brought in for repairs to correct a failure at another certified station, a station employee must advise the motorist that the I/M test will have to be done again if repairs are not performed at the same facility that per-formed the original I/M "I" test on the vehicle. If the customer agrees, a certified mechanic must perform an "I" test and then the station must prepare a cost estimate as described in Step 2.

2. Step 2 - Prepare an Estimate for Repair of All Defects: If the vehicle is being repaired at the same station that performed the "I" test, an employee of the certified station, or the mechanic, must review the VIR and prepare a cost estimate.

   If a VIR indicates "FAILED," you must check to see what defects are listed in the REASONS FOR FAILURE, VISUAL INSPECTION RESULTS, FUNCTIONAL TEST RESULTS and OBDII test results areas of the VIR and confirm the precise nature of these defects. Additional defects may be discovered.

   The certified station must estimate the cost of necessary repair work. This is the Total Emissions Repair Cost Estimate. A charge may not be included for an after-repair test using the EIS unless the initial inspection or repair was performed at a different facility.

   A certified mechanic or station must inform the motorist that no more than the applicable cost minimum at 18 AAC 52.065 is required, but the mechanic or station must estimate the cost of fully repairing each failed vehicle. You are encouraged to inform motorists that fully repairing their vehicles will improve the chances of passing the next inspection.

   Emissions-related repair cost minimums for all categories of vehicles are set out at 18 AAC 52.065. Vehicles described at 18 AAC 52.065(c) require completion of all necessary emission repairs regardless of cost.

   If the cost estimate exceeds the applicable cost minimum, you must determine how many of the repairs can be done to meet the cost minimum. The referee facility must

confirm this estimate before issuing a repair cost waiver. Alternatively, you may tell the motorist to go to the referee facility for this determination. Repair cost waivers can only be approved by the referee facility.

Parts Prices - Sometimes prices for parts are difficult to get. However, all of the major suppliers of repair manuals also supply parts and labor guides. In these books, the quoted price of parts is usually lower then the actual price of those parts in Alaska. Therefore, the certified station should determine what percentage should be added as a markup. In this way, price estimates are available for all or nearly all parts that could be required.

Original Equipment Manufacturer (OEM) Parts - If the vehicle is less than five years old and has less than 50,000 miles, the motorist may choose to have the required repairs estimated using only OEM parts and manufacturer-recommended procedures. If the vehicle is more than five years old or has more than 50,000 miles, the Total Emission

Repair Cost Estimate must reflect the least costly repair approved by ADEC's I/M Office. If the least costly repair is possible under the cost minimum, the vehicle must be repaired. The motorist may choose a more expensive repair (e.g., using OEM parts), but only the amount of the least costly repair approved by ADEC's I/M office may be applied toward the cost minimum.

Used Parts - Neither a motorist nor a certified station is ever required to procure used parts for required I/M repairs. If a motorist elects to procure used parts that are in operable condition, and the policy of the station where the repairs are being performed does not exclude their use, ADEC's I/M office has no objection. However, only expenses actually incurred may be counted against the cost minimum.   **Note: This does NOT apply to catalytic converters. The criteria for the use of a used catalytic converter, in (t) of Part IV of the I/M Program Manual, are very stringent.**

If the station elects to procure used parts and warranty them to be serviceable, the estimate of repairs may reflect the cost of the used parts and the motorist is obligated to have the repair performed or pay for another "I" test elsewhere. The estimate may not reflect a separate charge for time spent in the procurement of used parts and the repair must be concluded in a timely manner.

3. Step 3 - Determine Whether the Repair Cost Minimum is Met: The emissions-related repair cost minimums are set out in 18 AAC 52.065.

Examples of Repair Cost Determinations - The following examples of repair cost determinations are provided to assist certified stations and mechanics in correctly interpreting the repair cost minimums:

Example 1: Inspection of a vehicle that was originally equipped with a catalytic converter indicates: 1) the catalyst has been removed and replaced with a section of straight pipe, 2) the intake air heating system has been disconnected and 3) the PCV valve is sticking in one position. The cost estimate for complete repair of the vehicle is $275 for the catalyst replacement, $5 for the reassembly of the intake air heating system and $5 for the replacement of the PCV valve for a Total Emissions Repair Cost Estimate of $285.

Full repair of all the defects is required. The Total Emissions Repair Cost Estimate is below the $450 cost minimum.

Example 2: Inspection of another vehicle indicates that tailpipe emissions greatly exceed the standards due to a broken air pump belt, a dirty air cleaner element and a large dent in the side of the catalytic converter. The cost estimate for complete repair of the vehicle is $10 for replacement of the air pump belt, $10 for the replacement of the air cleaner element and $525 for replacement of the catalytic converter for a Total Emissions Repair Cost Estimate of $545.

Full repair of all defects is required. Replacement of the dirty air cleaner element for $10 would be required first, since it is covered under the category of "Incorrect Air/Fuel Ratio Due to Other Problems," which is fifth on the list of required repairs described below. Replacement of the broken air pump belt for $10 would be required next, since it is covered under the category of "Air Injection System Failure," which is sixth on the list of required repairs. (The AIS belt may be considered tampering, but that will make no difference in this instance.) Replacement of the catalyst for $525 would be required next, since it is covered under the category of "Catalyst Failure," which is eighth on the list of required repairs. (The damage suffered by the CAT cannot be considered tampering and therefore must be addressed under the "non-tampered" ceiling.)

For example, because the $450 cost minimum was not satisfied by the $20 spent on the previous repairs, the $525 repair of the CAT is required. In this example, the motorist is required to have $545 in repairs performed.

Example 3: Inspection of yet another vehicle indicates that the intake manifold, the carburetor and the air cleaner assembly have been replaced with unacceptable aftermarket parts. The Total Emissions Repair Costs Estimate indicates that the intake manifold can be replaced for $321, the carburetor for $267 and the air cleaner assembly for $242 for a total cost of $830. You determine that none of these parts can be replaced separately because the original equipment parts will not match the aftermarket parts presently installed, however, all repairs must be performed in any case because a single repair cannot be performed independently and because a tampered vehicle must be repaired completely regardless of cost.

4. Step 4 - Determine Which Repairs Need to Be Made**:** If the cost estimate exceeds the

repair cost minimum, you must determine how many of the repairs can be made before the cost minimum is exceeded. You may not include the cost of, and need not replace, any part that ADEC's I/M Office finds is no longer commercially available. You must add the cost estimates for repairing other problems listed on the VIR until the last defect repaired causes the total repair cost to exceed the applicable cost minimum. All of the listed repairs, including the one that causes the total repair cost to exceed the applicable cost minimum, must be included in the cost estimate.

You must perform this step in the following order:

• Warning Light and MIL Failure;

• Misfire;

• Feedback Control System Failure;

• Incorrect Idle Mixture Setting;

• Incorrect Air/Fuel Ratio Due to Other Problems;

• Air Injection System Failure;

• Other Visual/Functional Failures, Except Catalyst Failure; and

• Catalytic Converter System Failure (If the vehicle has both AIS and CAT-related defects, you must first perform the repairs to the AIS unless the sole function of the AIS is to deliver air directly to the CAT. In that case, the CAT should be replaced before the AIS is repaired.).

If catalyst replacement is suggested, an approved aftermarket catalyst must be used if an OEM catalyst would cause the cost minimum to be exceeded and the use of an aftermarket catalyst would not. The motorist may authorize the use of an OEM catalyst. However, the motorist may not apply the additional cost to the cost minimum.

5. Step 5 - Present Estimate to Motorist: Next, you must present the repair cost estimates to the motorist and advise that emissions repairs are required, at least up to the applicable cost minimum, that additional emissions repairs are voluntary and must be authorized in writing. If the motorist agrees to have repairs performed and all of the necessary emissions-related parts are available, you should follow the repair procedures set out in (u) of this Part. If the motorist does not agree that certain repairs should be performed, tell the motorist that the referee facility is available to review the results of I/M tests.

If emissions-related parts must be purchased or ordered before repairs are made, tell the motorist to return for repairs when the parts are available.

You may refer the motorist, or the motorist may decide to take the vehicle, to another facility for the completion of repairs. The motorist must be told in advance that a certificate of inspection cannot be issued until the repairs are made and a reinspection performed.

> Under 18 AAC 52.065(b) and 18 AAC 52.105, it is a violation of these procedures to perform partial emissions repairs.

6. Step 6 - Prepare Preliminary Work Order: Before performing any I/M repair, the motorist must pre-approve each repair by signing a preliminary work order that details the repairs to be performed. The motorist must receive a copy of any signed document as soon as it is signed. The preliminary work order must contain:

   A.   the customer's full name, mailing address, and telephone number;

   B.   the year, make, and license number of the vehicle;

   C.   the mileage shown on the odometer;

   D.   the date the work order was initiated and the date it was completed, if different;

   E.   a clear and legible account of the services proposed that separately itemizes the charge for parts and the charge for labor for each repair or service proposed; and

   F.   the customer's signature, if any repair or service other than an I/M test is to be performed.

t. Perform Repairs: This section describes procedures that must be used during the repair of each type of emissions defect that causes a vehicle to fail the inspection. Certified mechanics and stations must follow these procedures *in the exact order* listed in this section to correct all defects that are within the applicable cost minimum and then perform additional repair work as authorized by the motorist.

If the motorist wants to use the cost minimum, repairs may not be performed until authorized by the referee facility. The station may call the referee facility for repair authorization or refer the vehicle to the referee prior to any emission repair.

Repairs may be performed only after the preliminary work order has been signed by the motorist. It is the responsibility of the certified station and I/M mechanic to ensure that all required steps are followed before beginning repairs.

Repairs may not be made at any station that lacks the expertise, special tools, equipment or replacement parts that are required to repair the vehicle properly. A charge may not be made for an I/M test if the station cannot complete the repairs required due to a lack of tools, equipment or knowledge.

An I/M test must be performed prior to initiating any emission-effective repairs. An I/M test or emission repair may not be performed and motorist may not be charged for an I/M test or emission repairs performed on a vehicle subject to the I/M program if the vehicle registration will expire in less than 90 days or the vehicle is scheduled for an I/M test.

These repair procedures are not intended to provide step-by-step instructions for an untrained mechanic. They are intended for use by certified mechanics. They are general in nature and may not apply directly to every vehicle make and model.

> Under 18 AAC 52.105(b), deviation from these procedures is grounds for suspending or revoking certification of the mechanic and the station that employs the mechanic. **ALL REPAIRS PERFORMED AT A CERTIFIED STATION MUST BE PERFORMED BY A CERTIFIED MECHANIC.**

1. Warning Light or MIL Failure: It is normally not possible to produce an estimate for the repair of this type of problem. Therefore, authorization must be obtained from the motorist to perform those diagnostic procedures that will allow you to produce a reasonably accurate estimate of repairs. Further authorization from the motorist is required after a second estimate is produced and before any actual repair is performed.

    The first step in the diagnosis of a warning light failure is to determine what diagnostic trouble codes have been set and to check the vacuum hoses and wiring in the systems indicated. Check for open or grounded circuits or disconnected or leaking vacuum hoses. The second step is to test the components indicated. Follow diagnostic and service procedures specified in the vehicle owner's manual or an emission repair manual to diagnose components. The diagnostic procedures specified for vehicles with computer-controlled systems sometimes require special test equipment. Mechanics who are not able to perform the manufacturer's specified procedures should not attempt to make the diagnosis or repairs and the motorist should not be charged for the "I" test. Refer the motorist to a franchised dealer or another certified station that can perform the necessary repairs.

    If the cost of the diagnosis plus the estimated cost of the indicated repairs will exceed the applicable cost minimum, explain the cost minimum to the motorist and refer the vehicle to the referee facility if the motorist does not wish to authorize repairs in excess of the cost minimum. Explain to the motorist that the cost of the diagnosis may

be wasted if the indicated repairs are not performed.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure (for either CO or HC) was recorded during the "I" test, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure should be used and the emissions checked again. (The EIS will provide automatic preconditioning and "second-chance" testing for vehicles failing for excessive emissions if testing is performed using the EIS's official I/M test mode. However, mechanics may use the EIS's manual test mode to measure emission levels during repairs. Care should therefore be taken to ensure that vehicles tested in the manual mode are adequately preconditioned.)

2. Misfire: A misfire occurs when the air/fuel mixture in one or more cylinders fails to ignite. The unburned hydrocarbons in the fuel go into the exhaust causing very high HC emissions. High HC emissions (over 500 ppm) without high CO emissions are usually due to a misfiring cylinder. Misfires can also occur in vehicles with high CO. Often a misfire can be detected just by listening to the engine or the exhaust. Rough idling or an intermittent gap in the engine or exhaust noise level indicates a misfire problem. When the vehicle is being driven, misfire can often be detected by the failure of the engine to provide a smooth and even power level.

Determine the cause of any misfire. Misfires are usually due to one of three causes:

1. ignition problems (no spark or a weak spark in one or more cylinders);

2. too lean a mixture; or

3. too much EGR at idle.

Common fuel injection related problems that can contribute to misfire include partially plugged fuel filters, injector tip deposits and defective sensors used by the powertrain control module (PCM) to control the fuel injection rate. Such sensors may include those related to engine speed (RPM), throttle position (TPS), manifold air pressure (MAP), mass air flow (MAF) and coolant temperature (CTS).

The following checks should be performed to diagnose and repair misfire:

1. check spark plug firing (secondary) voltage with an ignition system analyzer to determine whether misfire is occurring in one or more cylinders;

2. check for proper routing of ignition wires if firing voltage is okay but misfire can still be heard;

3. if misfire remains after the above steps, check for vacuum leaks;

4. if misfire remains after the check for vacuum leaks, perform a functional

check of the EGR valve to make sure that EGR flow is shut off at idle; and

5.   if misfire remains after the EGR check, check for fouled or defective fuel injectors or other fuel injection related problems.

All misfire must be corrected. It may be necessary to correct repair items further down the list in order to correct all misfire. Use manufacturer-recommended procedures for correcting the cause of all misfires.

Note: Only those parts that are actually defective may be replaced or repaired.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure was recorded during the "I" test, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure should be used and the emissions checked again.

3.   Feedback Control System Failure: The term "feedback control" or "closed-loop control" indicates that one parameter (for example, fuel pressure) is being continuously adjusted in response to changes in some other measured value (in this case, air/fuel ratio). Feedback control failures may have been corrected by the repair of warning light failures or misfire failures.

A. Carburetor-Related Checks: If the feedback system failed due to a visual or functional problem that has not been corrected, determine if the carburetor and other components are correct for the vehicle. Next, check the carburetor linkage, choke, and choke linkage for free and full movement. Check the carburetor for obvious over-fueling. If this problem exists, the VIR should show a failing reading for CO. Replace any unapproved parts and repair any defects found. Replacement of a modified carburetor with an aftermarket or rebuilt carburetor is a violation of these procedures, unless the replacement carburetor is certified as meeting the same specifications as the original equipment carburetor by the manufacturer of the carburetor, CARB or EPA. [See 18 AAC 52.105(b)]

There is no provision allowing you to modify an existing carburetor that is incorrect for the present application. Such a modification is tampering. The only acceptable repair is replacement with an appropriate carburetor for that vehicle.

B. O_2 Sensor Checks: Most vehicles manufactured since 1981 are equipped with feedback control systems that use an exhaust gas oxygen sensor (O_2 sensor) to maintain a "stoichiometric" air/fuel ratio (which ideally should be about 14.7:1 -- that is 14.7 pounds of air to 1 pound of fuel for gasoline that contains neither alcohol nor oxygenate -- for complete combustion). The O_2 sensor informs the computer whether the engine is running too rich or too lean and the computer directs the fuel injection system or carburetor to make the necessary adjustments in fuel flow. Proper operation of the O_2 sensor is necessary for a three-way catalyst

to simultaneously control HC, CO and NOx. If the mixture is too rich, there will not be enough oxygen in the exhaust gas to complete the oxidation of CO and HC emissions in the catalyst. If the mixture is too lean, the catalyst cannot reduce NOx emissions. If the mixture is kept very close to the stoichiometric ratio (where fuel and oxygen are perfectly balanced), a three-way catalyst will simultaneously control HC, CO and NOx.

Check the connections to the O_2 sensor. Check the vacuum and electrical connections to other sensors (e.g., coolant temperature sensor) and the mixture control solenoid on carbureted vehicles. Check for vacuum leaks or improper air injection upstream of O_2 sensor.

C. Other Checks: If the vehicle has fuel injection, check for any modifications or damage to the system. Check any air flow meters or other control components for obvious maladjustment, misalignment or damage. Manufacturer-specific diagnostic procedures, scan tools or other aids may be needed if the above approaches do not identify the problem.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure was recorded during the "I" test, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure should be used and the emissions checked again.

4. Incorrect Idle Mixture Setting: If the repairs performed have not corrected an existing high emissions problem or no failure was recorded for the previous items and a high emissions problem exists, proceed with fuel system adjustments. Before performing any adjustments, check for loose, missing or binding linkage or faults with wires or hoses. After any defects are corrected, proceed with adjustments.

All non-feedback vehicles and most feedback vehicles equipped with carburetors or Bosch CIS (mechanical) fuel injection have adjustable settings for the air-fuel mixture at idle. Since 1980, the mixture settings on emission-controlled vehicles have been sealed at the factory to prevent tampering. If these seals are intact, you should NOT try to alter the settings except as a last resort and ONLY after going through the complete factory diagnostic procedure. Refer to the manufacturer's service manual for further information. Different manufacturers require different mixture setting procedures, such as propane gain or exhaust CO measurements. Refer to the manufacturer's service manual or an emissions control manual and to the emissions tune-up label for specific instructions for the vehicle you are working on.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure was recorded during the "I" test, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure should be used and the emissions checked again.

5. Incorrect Air/Fuel Ratio Due to Other Problems: If the repairs performed have still not corrected an existing high emissions problem or no failure was recorded for the previous items and a high emissions problem exists, a number of miscellaneous problems known to cause air/fuel mixture enrichment should be investigated. These potential problems and the procedures used to diagnose them include:

A. plugged PCV systems (which significantly restrict intake air flow at idle on some vehicles) -- perform a functional test of the PCV system to determine whether it is plugged;

B. dirty air cleaners (which also restrict intake air flow) -- visually inspect the air cleaner for fouling;

C. improperly adjusted or stuck chokes on carbureted vehicles (which increase fuel flow)--visually check to see if the choke is fully open when the engine is warm;

D. saturated evaporative emissions control canisters (which can flood the engine with an excessively rich mixture) -- check for a fuel-saturated evaporative canister by measuring CO emissions with the EVAP properly connected and the purge line either disconnected from the canister and plugged or pinched off; and

E. dilution of the crankcase with gasoline (which causes enrichment through the PCV system flow) -- check for fuel in the crankcase by measuring CO emissions with and without the PCV valve unplugged from the crankcase/valve cover (but still connected to the intake manifold).

If the idle mixture adjustment procedures described above do not reduce idle emission levels to factory standards, there could be an internal carburetor problem. This is especially true if CO emissions at 2500 rpm are not lower than CO emissions at idle. Check for a high float level or leaking float. Check for a defective power valve or power enrichment device.

If none of these checks uncover the source of the problem, a carburetor rebuild may have to be considered on vehicles so equipped. However, only replace internal components or completely rebuild the carburetor AS A LAST RESORT.

Note: Never do a carburetor rebuild on a vehicle equipped with an exhaust oxygen sensor (lambda sensor) unless the manufacturer's recommended diagnostic procedures are followed to eliminate the high emission problem.

Rebuilding carburetors on oxygen sensor equipped vehicles is a violation of these procedures unless the computer control system and carburetor have been diagnosed and repaired using manufacturer-specified procedures and test equipment. See 18 AAC 52.105(b).

As discussed above, checks for internal carburetor problems should be considered a last resort. Carburetor rebuilds are often mistakenly performed as a result of overlooking a more obvious cause for mixture enrichment. Before a carburetor rebuild is performed on a 1980 or newer model, every effort should be made to properly diagnose defects in vehicles that still fail to pass the emissions test after completion of the above generic diagnostic and repair procedures.

6. Air Injection System (AIS) Failure: The AIS is used to help cleanup vehicle emissions by injecting fresh air into the vehicle's exhaust in an attempt to keep the mixture burning after it leaves the combustion chambers. On many cars with CATs, the AIS assists in "lighting-off" the CAT and continuing the oxidation process by supplying oxygen.

The AIS generally consists of, but is not limited to, the following components:

- an air pump or other air injection system; some late-model air injection vehicles do not use an air pump, but instead use a pulse type system; these systems are maybe to identify and can be mistaken for a non-AIS vehicle; always check the VEC label and the quick reference ECS manual for the correct application;

- air supply and vacuum signal lines;

- various valves (including bypass, diverter, gulp, relief, delay temperature, air switching and check valves); and

- air distribution tubes.

A. Visual inspection results: If the VISUAL INSPECTION RESULTS area on the VIR indicates that the AIS was "Disconnected," look for missing air pump drive belts, tubing, valves and hoses. If portions of the AIS appear to be missing, refer to an ECS manual to determine which components need to be replaced. Replace all missing components.

B. Functional test results: If the FUNCTIONAL TEST RESULTS area on the VIR indicates that the AIS "Failed," conduct the following checks:

i. Air Pump Belt Check - Check the air pump belt tension. A typical setting for a used belt is 55 lbs. For particular applications, refer to an emission manual.

ii. Air Flow Check - Remove one of the outlet hoses and accelerate the engine to approximately 1500 rpm to observe air flow. The flow must increase as the engine speed increases. If the hoses are hard or show evidence of scorching or cracking, **do not attempt to remove a hose until the motorist agrees to hose**

replacement. Be very careful not to break a weakened check valve during the test. (The air management system on a 3-way catalyst vehicle is complex. Be sure that you know where the air should be going before you pull a hose to check the air flow.) If the air flow increases as the engine is accelerated, the pump is operating satisfactorily. If the air flow is not present or does not increase, proceed to the leak check described below.

iii. Leak Check - Check for leaks in hoses or tubing and diverter, gulp or bypass valve failure. Check for leaking relief valve or other pump malfunctions. The valve(s) that switch, divert, gulp, bypass, dump and control the air supply vary considerably in configuration and operation from model to model. Always consult an emission manual for configuration, operation and testing procedure.

iv. Check Valve - One of the most common air injection failures is the check valve. The check valve(s) is subjected to high exhaust temperature and pressure, cooler air from the air pump or supply and water from the exhaust gases. The combination of these elements may lead to early valve failure (for example, corrosion). Quite often these valves freeze in the open position, which in turn can cause pump failures. Inspect the hose from the pump to the check valve for cracking or signs of charring or burning. Inspect the exterior of the valve for rust and corrosion. Check for air being diverted to other areas or through the relief valve.

To test the check valve, disconnect the air delivery hose from the pump and check for pulsation provided by the valve. If no or little pulsation is present, the valve is probably defective. Listen or feel for exhaust gases leaking excessively past the check valve. If this is occurring, the hoses may be charring or burning and the exhaust gases may have damaged the pump or other components. You may use the EIS in the manual mode to check for exhaust exiting the check valve hose. Remember that even a nondefective valve will probably exhibit some leakage. Be very careful not to break a hose or a weakened check valve.   If there is any question about the condition of the hose and check valve, be sure the customer agrees to pay if damage occurs.

v. Noise Check - If the pump is excessively noisy, check for a loose drive belt or a seized or seizing pump, leaking hoses, improperly routed or pinched hoses, loose pump mountings or other pump damage.

C. Air Diversion: To prevent backfires and protect the catalyst from overheating, both pulse and air pump air injection systems usually include provisions for diverting the air to the air cleaner or back to the atmosphere under some operating conditions such as full-throttle, deceleration or prolonged idling. Problems with control of this air diversion are a common cause of I/M test failures. To check that the air is being injected where it should be during the test, use the following procedure:

1. precondition the vehicle using the correct procedure in l. of this Part IV (including the key-off/restart sequence, if required); for systems that inject air after the vehicle is warmed up, this will reset any air diversion timers;

2. with the engine idling, measure the stabilized HC, CO and CO_2 emissions using manual mode on the EIS;

3. with the engine still idling, pinch off the air line from the air control valve to the place (catalyst or manifold) where air should be being injected; you should see a significant increase in HC and CO emissions when the air is cut off; release the air line; the emissions should return to their previous levels; and

4. if HC and CO emissions don't increase when you pinch the air line, it is probably because the air isn't being injected where it should be; to make sure, check the CO_2 reading; if the CO_2 reading didn't increase by more than 0.5% (for example, from 14.0% to 14.5% CO_2) when you pinched the air line, then no air was flowing in the line; look for a bad air pump, malfunctioning air control valve, no vacuum signal to the air control valve, or leaking air hoses; if necessary, consult the manufacturer's service manual or an emissions service manual for specific diagnostic procedures.

In some cases, the air line may not be accessible or may not be collapsible (through pinching) without damaging it. If so, disconnect the hose to eliminate the air supply. Plug the end of the hose connected to the exhaust system to prevent hot exhaust gas from flowing through the hose. In addition, some computer-controlled vehicles divert air after as little as 30 seconds of idling. Be sure to begin the test immediately after you finish the preconditioning. A sudden jump in HC and CO emissions BEFORE you pinch off the air line may be due to the computer diverting the air. This also indicates that the AIS is working properly.

A few feedback vehicles inject air into the exhaust manifold instead of the middle of the CAT at idle. If you suspect this is happening, try pinching the air line to the exhaust manifold and see if the HC and CO emissions increase. If they do, air is being injected into the manifold. To check whether air is being properly routed to the CAT in off-idle conditions, repeat steps 1-3 above while running the engine at 2500 RPM. If the CO_2 reading INCREASED 0.5% or more when you pinched the air line, but the HC and CO readings didn't change much, then the AIS is working but the CAT is probably inactive.

Repair or replace above components as necessary. If all or a portion of the AIS is missing, refer to an emission manual to determine which components need to be replaced. Replace all missing components.

If authorization is received, proceed with indicated repairs. If a tailpipe

emissions failure was recorded during the "I" test and was not corrected previously, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure in l. of this Part should be used and the emissions checked again.

7. Other Visual and Functional Defects Except CAT Failure: Failures to be corrected under this step include any visual or functional failures not repaired under the preceding steps (except for CAT failures) including the following emission control components: hoses and wires, air filter, PCV system and intake air heaters.

   A. Vacuum Hoses or Wires: Any problems with vacuum lines and electrical wiring that were not corrected previously should be corrected now. Disconnected or broken vacuum lines may be a source of a vacuum leak.

   Note: Simple vacuum line defects are a common cause of high emissions.

   One indication of a vacuum leak is unsteady and high hydrocarbon (HC) emissions at idle or 2500 rpm in neutral. Another indication is a hissing sound. Not all vacuum leaks are due to faulty hoses. All vacuum leaks should be identified and corrected.

   Look for loose ends of vacuum hoses and loose wires in the engine compartment. Check the manufacturer's wiring and vacuum hose diagrams for the vehicle (they may be found on an underhood label, in the owner's manual, or in the emission control manual for the vehicle) to determine the proper connections and reinstall all hoses or wires properly. Devices that may require vacuum line reconnection include Exhaust Gas Recirculation (EGR) Systems, Thermal Vacuum Switches, Thermostatic Air Cleaner Systems, and Spark Advance Control Systems.

   Check to see whether the reconnected vacuum hoses are secure (not easily pulled off). If the reconnected hoses are not secure, do one or more of the following to obtain a secure connection:

        i. clamp hose in place;

        ii. if hose is long enough, cut off end and reinstall; or

        iii. install new hose.

   Check the security of any reconnected wires. A malformed connector seriously reduces the contact area of the connector and can lead to future problems. Be sure the connectors are clean and properly connected. If the connector cannot be made secure, replace the connector.

If hoses or wires appear to be missing, vacuum line and wiring diagrams may have to be more carefully reviewed to determine which vacuum lines and wires are missing. A missing vacuum line will often be evident by the presence of a short piece of vacuum line attached to the carburetor or intake manifold and plugged with a screw or bolt. If this is the reason for the failure, it may also indicate a missing hose or tube in the PCV system. Replace all missing hoses and wires that are identified.

If the hoses or wires are modified, the problem will normally be with two or more vacuum lines. Look for vacuum lines that connect one vacuum port to another. Also look for nipples or control devices that have no vacuum line connected to them. Refer to vacuum line and wiring diagrams to determine proper routing and correct all errors. Also check for cracked or broken vacuum lines and bare or broken wires. Replace defective components.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure was recorded during the "I" test and was not corrected previously, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure in l of this Part IV should be used and the emissions checked again.

B. Air Filter: If high CO emissions were the cause for failure, visually checking the condition of the air filter should also be done before more complicated diagnosis is performed. Clean or replace dirty filters. Install the air cleaner lid right side up if it was installed upside down. (Upside-down air cleaner lids cause higher evaporative emissions and driveability problems on vehicles equipped with thermostatic air cleaner systems.)

C. Positive Crankcase Ventilation (PCV) System: Inspect the PCV system visually and functionally to determine the exact problem. Clean or replace defective or missing parts as necessary. Make sure all hoses are secure and free of cracks or breaks. Remove the valve and check for free movement of internal parts by shaking the valve. Replace PCV valves that are not operating freely.

D. Intake Air Heaters (TAC): Problems with the TAC may have been corrected previously. If not, replace any missing parts and check all connections and components for correct operation. Test each component to ensure that the system will function properly after repair. Test the temperature-operated air bleed or bulb-type TAC system with a compressed air-operated "Choke Checker" or equivalent tool. Test the vacuum motor(s) with a hand-operated vacuum pump with a gauge. The fresh air intake tube that was originally installed on some vehicles is no longer required.

E. Other Components: Any other components that have failed visually or functionally should be repaired or replaced at this time.

If authorization is received, proceed with indicated repairs. If a tailpipe emissions failure was recorded during the "I" test and was not corrected previously, the emissions should be checked before further repairs are performed. If the vehicle still fails for high emissions, the appropriate preconditioning procedure in (l) of this Part should be used and the emissions checked again.

8. Catalyst Failure: Failure to meet the tailpipe emissions standards that apply to 1980 and newer vehicles may also be due to a defective catalytic converter. This should be the final visual/functional failure to be corrected, since the presence of other emissions-related defects, if not corrected, could cause a replacement converter to fail as well. The catalytic converter systems reduce the amount of HC, CO, and, with the three-way catalyst, NOx in automobile emissions. This is accomplished by bringing the exhaust gas into contact with a chemical catalyst to aid in the oxidation of HC and CO, and the reduction of NOx. All catalysts are poisoned by the use of leaded gasoline. Unleaded fuel is therefore required in catalyst-equipped vehicles.

The basic components of most catalytic converter systems are:

1. Converter - a catalyst-coated honeycomb or catalyst-coated pellets contained in a stainless steel housing;

2. Heat Shields - protect the undercarriage of the vehicle from extreme heat;

3. Lead Restrictor - special fuel tank filler neck that only allows insertion of an unleaded fuel nozzle; (note: inspection of the lead restrictor is not required);

4. Catalyst Protection System - protects the catalyst from overheating with warning lights, buzzers and diversion of air injection during critical conditions; and

5. Air/Fuel Ratio Feedback System - this system is used with most three-way catalytic converter systems to closely control air/fuel ratio using an electronic control microprocessor connected to oxygen and other parameter sensors.

A. If the CAT has been removed from the vehicle: install a new CAT and any connecting pipes necessary to correct this problem. Vehicles with missing CATs must also be checked to determine whether CATs, AIS and heat shields are properly installed. Defects must be repaired.

B. If the CAT is modified, the following procedures must be used:

1. check to see that the CAT and all related components are properly installed and that no modifications have been made; the CAT or CATs should be connected; in addition, all CAT protection system components and connecting hoses should be in place, and the configuration of the exhaust system must

conform to the configuration in which it was manufactured from the rear of the CAT forward; defects must be repaired;

2. check the CAT protection system connecting hoses for cracks, deterioration and loose connections; defects must be repaired; and

3. check the CAT for evidence of physical damage; if there are large dents, ruptures, punctures or if there are pellets coming out of the tailpipe, install a new CAT.

C. Used CATs: A used CAT cannot be installed on a vehicle, unless it is supplied by an EPA or CARB-approved vendor of tested and approved CATs and its use is approved by ADEC's I/M Office.

D. Aftermarket CATs: Only an aftermarket CAT listed in an approved manufacturer's catalog or an approved re-manufacturer's catalog as marketed for the specific make, model, model year, and engine may be used. Aftermarket CATs marketed as "universal" CATs by vehicle weight and engine size are allowed, as long as the installation does not restrict or hinder the exhaust flow.

Note: An aftermarket replacement CAT may be installed on a vehicle only if:

1. the vehicle is missing a CAT;

2. the referee facility has determined that the CAT requires replacement; or

3. the vehicle is more than five years old or has more than 50,000 miles and a legitimate need for a replacement CAT has been established and documented.

The invoice for a replacement CAT must include the customer's name, address, vehicle make, model year, mileage, and the reason for replacement. It must also state if the vehicle did or did not fail an I/M test. If a replacement is required by the referee facility, the station must keep a copy of the Referee Facility Required Repair Form on file. Stations must retain replaced CATs for 60 days, properly identify them as to the vehicle they came from and surrender them to ADEC's I/M Office if requested. CATs surrendered to ADEC's I/M Office will be returned to the station, if possible.

Note: A replacement CAT must be:

1. installed in the same location as the original;

2. the same type as the original (oxidation, 3-way, or 3-way plus oxidation (dualbed));

3. the proper CAT for the vehicle as specified by the CAT manufacturer;

4. installed with the identification tag visible after installation;

5. properly connected to any existing air injection components;

6. installed with all other required converters; and

7. accompanied by a warranty information card filled in by the installer.

u.   Perform After-Repair "A" Test: After performing the necessary repairs, you must use the EIS to retest the vehicle. Log on to the EIS as described in (a) of this Part IV, entering test type "A" for "after-repair" instead of test type "I." If the EIS is only being used to check the results of ECS-related repairs and no official after-repair test is being performed, it is still advisable to check such repairs, especially referee-required repairs, by performing a test in the I/M mode rather than the manual testing (tune-up) mode. This is because the EIS uses a different measurement protocol for the tune-up mode, which may in some cases affect the emission readings. If an official after-repair test is not being performed, enter abort code #13 to abort the I/M tests. An I/M test fee may not be charged for this procedure.

Perform the "A" test in the manner described in (a) -- (l) of this Part IV. In performing the "A" test, visual inspections and functional tests that were previously performed are unnecessary. Enter a "Pass (P)" for each item that was repaired. If an "A" test is being performed, all defects must be corrected. Another exhaust emissions test is required on the vehicle. After the test, repair information on the vehicle must be entered, as described in (m) of this Part IV.

After completing the "A" test and entering the required repair information, the EIS will prompt you to confirm the number of the certificate of inspection issued for the vehicle. **NOTE:** Any discrepancy in the information printed onto a certificate of inspection must be reported to the local I/M program office before the certificate of inspection is issued and no further I/M tests may be performed using that EIS until the discrepancy is corrected.

If the "A" test indicates that the vehicle still exceeds the tailpipe emission standards, the EIS will not pass a vehicle even if all possible repairs have been performed. If this occurs, no certificate of inspection may be issued and the motorist must not be charged for the repairs. The customer must be given a copy of all I/M documentation and referred to the referee facility. Parts that were replaced during the repairs may be removed and the original parts may be reinstalled.

v.   Prepare Final Work Order: The final work order should include all of the information required in the preliminary work order as well as the repairs that were actually performed and the charges that were actually made.

w.   Instructions to Motorist: After the successful completion of all repairs and the retesting of the vehicle, the motorist must be provided with a copy of the final work order and be issued a VIR and a certificate of inspection. **NOTE:** Any discrepancy in the information printed onto a certificate of inspection must be reported to the local I/M program office before the certificate of inspection is issued and further I/M tests may not be performed using that EIS until the discrepancy is corrected.

Until August 1, 2002, the mechanic who performs a passing I/M test must sign the certificate of inspection. Fully explain the contents of the VIR to the motorist and, until August 31, 2002, tell the motorist to mail or take the certificate of inspection to the Alaska Division of Motor Vehicles (DMV) with the registration renewal notice and the fees specified by DMV. Beginning on September 1, 2002, tell the motorist to mail the registration renewal notice and required fees to the Alaska Division of Motor Vehicles (DMV). There will be no need for the motorist to mail in any documentation, as an electronic record of the certificate of inspection will have already been sent to DMV. The motorist may also call the local DMV office or re-register with DMV via the Internet.

PART V

LIST OF APPROVED AFTERMARKET PARTS

PART V. LIST OF APPROVED AFTERMARKET PARTS

Parts listed in attached Appendix F have been evaluated by the California Air Resources Board (CARB) and are exempted from the emission control anti-tampering laws of California. The Alaska Department of Environmental Conservation and the local I/M program offices are concerned that certain CARB exempted devices or modifications may not properly function under cold temperature conditions. However, until such time as the Alaska I/M Program is able to perform the necessary tests and certify a device for use in the cold temperatures of Alaska, the department adopts Appendix F as emission control system modifications that are exempt from the anti-tampering laws in Alaska.

The use of other approved aftermarket parts is allowed but not encouraged. Many of the parts on the following list have been approved solely because they have been shown to have no effect on either vehicle emissions or fuel economy. Their approval for installation on vehicles subject to the I/M program should not be considered an endorsement by the California Air Resources Board, the I/M Office, or the State of Alaska.

In addition to the listed aftermarket parts, certified stations may use other aftermarket replacement parts that are functionally identical to the manufacturer's original equipment parts in all respects that in any way affect emissions. An example of such a part would be a replacement engine hose. Explicit approval of such a replacement part by either the California Air Resources Board or ADEC's I/M Office is not required, although the California Air Resources Board does require the manufacturers of such parts to maintain records such as test data to substantiate that the replacement parts are functionally equivalent to the manufacturer's original equipment parts.

Appendix A: Bar Code Scanner

A bar code scanner must be used to read information from bar code labels placed on the vehicle by the manufacturer, DMV registration documents, Certificates of Inspection, Stickers and VIRs. VIN input sources include the VIN located on the vehicle, the VIR, Certificate of Inspection and registration renewal form. RRN input sources may include the VIR, Certificate of Inspection and registration renewal form. Bar codes on the VIR and registration renewal form must follow the standard "Code 39" convention. The scanner must be capable of reading all 1-D bar code types. The scanner must be user-replaceable without requiring access to secured areas of the analyzer. The scanner must not be proprietary. The scanner must be able to extend a distance of at least twenty-five feet (25') from the analyzer and be able to read bar codes placed on the door frames, under the hood, on DMV forms and through windshields. The manufacturer is expected to include any software necessary to utilize the data gathered from labels in accordance with this specification. The analyzer must be equipped with an RS232C connector for the bar code scanner. ADEC may consider alternative designs.

Appendix B
Exhaust Emission Standards

Category	Description	CO (Idle)	CO (2500)	HC	CO + CO2	RPM
Cars (LDGV):		%	%	ppm	% Minimum	
01	1968 – 71, > 4 cyl	5.0	4.0	1000	8.0	1100
02	1968 – 71, ≤4 cyl	5.0	4.0	1000	7.0	1100
03	1972 – 74	4.0	3.0	1000	8.0	1100
04	1975 – 80	2.0	2.0	1000	8.0	1200
05	1981 – 83	1.0	1.0	1000	7.0	1200
06	1984 – 93	1.0	1.0	750	7.0	1200
07	1994 +	0.5	0.5	220	7.0	1200
Trucks (LDGT 1 and LDGT 2):						
08	1968 – 72, > 4 cyl	5.0	4.0	1000	8.0	1100
09	1968 – 72, ≤4 cyl	5.0	4.0	1000	7.0	1100
10	1973 – 78	4.0	3.0	1000	8.0	1100
11	1979 – 83	2.0	2.0	1000	7.0	1200
12	1984 – 93	1.0	1.0	750	7.0	1200
13	1994 +	0.5	0.5	220	7.0	1200
Trucks (HDGV):						
14	1968 – 73, All	5.0	5.0	1000	8.0	1100
15	1974 – 78, All	4.0	4.0	1000	8.0	1100
16	1979 – 93, All	4.0	4.0	1000	8.0	1100
17	1994 +, All	1.0	1.0	220	8.0	1100
LDGV	light-duty gasoline-fueled vehicles (passenger cars) not exceeding 8500 lbs. GVWR.					
LDGV1	light-duty gasoline-fueled trucks not exceeding 6000 lbs. GVWR (lighter pick-up trucks and vans).					
LDGT2	light-duty gasoline-fueled trucks over 6000 lbs. GVWR and not exceeding 8500 lbs. GVWR (heavier pick-up trucks and vans, and many commercial trucks).					
HDGV	heavy-duty gasoline-fueled vehicles over 8500 lbs. GVWR (heavier commercial trucks, buses and motorhomes).					

Appendix C
Cerificate of Inspection

ALASKA2000 CERTIFICATE OF INSPECTION

This certificate is valid for registration renewal for 90 days from its date of Issue.

I certify that (1) I have personally inspected this vehicle in accordance with the applicable state and local program Inspection and Maintenance requirements: (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements. **False statements, representations, or certifications may be punishable by law.**

{ BARCODE }
F1170072C

{ BARCODE }
1FABP52U8JG443214

{ BARCODE }
12345678

BXX334

| Invalid without Validation sticker (Place sticker here) |

FNSB Referee
FR000012
F00050000

X_____

XXXXXXXXXX Y. ZZZZZZZZZZZZ 09/10/2000

EXPIRES
BXX334
12 2001
A2878500C
[Security Code]

Tear off above portion and give to vehicle owner. Keep lower portion in file for 2 years with VIR copy.

ALASKA2000 CERTIFICATE OF INSPECTION

This certificate copy is not valid for registration renewal.

I certify that (1) I have personally inspected this vehicle in accordance with the applicable state and local program Inspection and Maintenance requirements: (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements. **False statements, representations, or certifications may be punishable by law.**

COPY

{ BARCODE }
F1170072C

{ BARCODE }
1FABP52U8JG443214

{ BARCODE }
12345678

BXX334

| Place Copy Sticker Here |

FNSB Referee
FR000012
F00050000

X_____

XXXXXXXXXX Y. ZZZZZZZZZZZZ 09/10/2000

EXPIRES
BXX334
12 2001
A2878500C
[Security Code]

Appendix C

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Important: Retain this document with your vehicle registration.
ALASKA2000 CERTIFICATE OF INSPECTION

This certificate is valid for registration renewal for 90 days from its date of Issue.

I certify that (1) the information displayed on the EIS correctly identifies this vehicle, and (2) that I have affixed a replacement sticker to the vehicle identified. **False statements, representations, or certifications may be punishable by law.**

{ **BARCODE** }
F1170072C

{ **BARCODE** }
1FABP52U8JG443214

{ **BARCODE** }
12345678

BXX334

Invalid without Validation sticker (Place sticker here)

FNSB Referee
FR000012
F00050000

X_____
XXXXXXXXXX Y. ZZZZZZZZZZZZ 09/10/2000

EXPIRES
12 2001
BXX334
A2878500C
[Security Code]

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{ **BARCODE** }
12345678

BXX334

Place Copy Sticker Here

FNSB Referee
FR000012
F00050000

X_____
XXXXXXXXXX Y. ZZZZZZZZZZZZ 09/10/2000

EXPIRES
12 2001
BXX334
A2878500C
[Security Code]

Appendix C

232

ALASKA2000 CERTIFICATE OF INSPECTION

This certificate is valid for registration renewal for 90 days from its date of Issue.

I certify that (1) I have personally inspected this vehicle in accordance with the applicable state and local program Inspection and Maintenance requirements: (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements. **False statements, representations, or certifications may be punishable by law.**

{ BARCODE of sticker number }
Sticker Number

License Number

Invalid without
Validation sticker
(Place sticker here)

Station Name
Station Number
Mechanic Number

{ BARCODE of VIN }
Vehicle Identification Number

{ BARCODE of License Number }
Registration Renewal Number

X_____
Certified Mechanic Name   **Test Date**

EXPIRES **License Number**

EIS-assigned expiration
MONTH and **YEAR**

Sticker Number

[security code]

Tear off above portion and give to vehicle owner. Keep lower portion on file for 2 years with VIR copy.

ALASKA2000 CERTIFICATE OF INSPECTION

COPY

This certificate copy is not valid for registration renewal.

I certify that (1) I have personally inspected this vehicle in accordance with the applicable state and local program Inspection and Maintenance requirements: (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements. **False statements, representations, or certifications may be punishable by law.**

{BARCODE of Sticker Number}
Sticker Number

License Number

Place Copy Sticker Here

Station Name
Station Number
Mechanic Number

{   BARCODE of VIN   }
Vehicle Identification Number

{BARCODE of License Number}
LIcense Number

X_____
Certified Mechanic Name   **Test Date**

EXPIRES **License Number**

EIS-assigned expiration
MONTH and **YEAR**

Sticker Number

[security code]

Appendix C

Important: Retain this document with your vehicle registration.
ALASKA2000 CERTIFICATE OF INSPECTION

This certificate is valid for registration renewal for 90 days from its date of Issue.

I certify that (1) the information displayed on the EIS correctly identifies this vehicle, and (2) that I have affixed a replacement sticker to the vehicle identified. **False statements, representations, or certifications may be punishable by law.**

{ **BARCODE of sticker number** }
Sticker Number

{ **BARCODE of VIN** }
Vehicle Identification Number

{ **BARCODE of License Number** }
Registration Renewal Number

License Number

Invalid without
Validation sticker
(Place sticker here)

X_____
Certified Mechanic Name   Test Date

Station Name
Station Number
Mechanic Number

EXPIRES

License Number

EIS-assigned expiration
MONTH and **YEAR**

Sticker Number

[security code]

Tear off above portion and give to vehicle owner. Keep lower portion on file for 2 years with VIR copy.
ALASKA2000 CERTIFICATE OF INSPECTION

COPY

This certificate copy is not valid for registration renewal.

I certify that (1) the information displayed on the EIS correctly identifies this vehicle, and (2) that I have affixed a replacement sticker to the vehicle identified. **False statements, representations, or certifications may be punishable by law.**

{ **BARCODE of Sticker Number** }
Sticker Number

{ **BARCODE of VIN** }
Vehicle Identification Number

{ **BARCODE of License Number** }
LIcense Number

License Number

Place Copy Sticker Here

X_____
Certified Mechanic Name   Test Date

Station Name
Station Number
Mechanic Number

EXPIRES

License Number

EIS-assigned expiration
MONTH and **YEAR**

Sticker Number

[security code]

Appendix C
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Only the sticker insert and a copy of the electronic record will be printed, if the current system date is greater than or equal to the "No Certificate Print Date" in the REGION table.

Remove insert and place on certificate of inspection sticker.
Keep lower portion in the file as required by I/M Program Office

COPY

This copy of the electronic record is not valid for registration renewal.

I certify that (1) I have personally inspected this vehicle in accordance with the applicable state and local program Inspection and Maintenance requirements: (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements. **False statements, representations, or certifications may be punishable by law.**

{ **BARCODE** }
F1170072C

BXX334

FNSB Referee
FR000012
F00050000

{ **BARCODE** }
1FABP52U8JG443214

Place Copy Sticker Here
(If Applicable)

{ **BARCODE** }
12345678

X_____
XXXXXXXXXX Y. ZZZZZZZZZZZZ 09/10/2000

VEHICLE INFORMATION

Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**1FABP52U8JG443214**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**BXX334**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION

VISUAL INSPECTION RESULTS

Air Injection System (AIS):	**P**	Intake Air Heater:	**P**		
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	P		
Catalytic Converter(s):	**F**	Early Fuel Evaporation (EFE):	**P**		
Vacuum Hoses and Wiring:	P	Other Emissions-Related Componets:	P		
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**		
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**		
		Malfunction Indicator Lamp	**P**		

FUNCTIONAL TEST RESULTS

Air Injection System (AIS):	**P**
Emission Control Maintenance Light/Indicator:	**P**
Major Vacuum Leaks:	**P**
Malfunction Indicator Lamp/Check Engine Light:	P
Positive Crankcase Ventilation (PCV):	**N**
Intake Air Heater:	**P**
Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION

	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

Appendix C

Certificate of Inspection

Specifications

1. Certificate begins printing 0.45" from top of page with 0.45" margin on left side.
2. Certificate is 3.0" long (from top of page).
3. Certificate is 7.0" wide (from left hand edge of page).
4. Sticker Insert begins printing 0.45" from top of page, 7.06" from left side of paper.
5. Sticker Insert is 3.0" long (from top of page).
6. Sticker Insert is 1.5" wide.
7. The certificate number must be barcoded (0.25" height) 0.625" from left edge of paper.
8. The certificate number must be printed in readable characters, Arial bold, font size 12, and 1.25" from left edge of paper.
9. The VIN must be barcoded (0.25" height) 0.625" from left edge of paper.
10. The VIN must be printed in readable characters, Arial bold, font size 12, 1.25" from left edge of paper.
11. The license plate number must be barcoded (0.25" height) 0.625" from left edge of paper.
12. The license plate number must be printed in readable characters, Arial bold, font size 12, and 1.25" from left edge of paper.
13. The certified I/M station name, certified I/M station number, certified I/M mechanic name and certified mechanic number and test date (mo/da/year) must be in readable characters, Arial bold, font size 12, as shown on example; at 3.5" from left edge of paper, the line for the I/M mechanic's signature, and the words "Certified I/M Mechanic" shall start at 5.375" from left edge of paper, the I/M station name and number and the I/M mechanic name and number must start at 5.75 the date of the I/M test must start.
14. Font must be Arial, sizes as follows for the rest of the certificate:
    top line "Important: Retain....." : size 9;
    2nd line "Alaska2000....": size 11 bold;
    3rd line "This certificate is valid...": size 9 bold;
    4th, 5th, and partial 6th line "I Certify.....": size 8;
    end of 6th line "False statements....": size 8 bold.
15. Sticker insert section:
    plate #, small font;
    large EIS-assigned expiration year ;
    large EIS-assigned expiration month;
    security code – to be determined.
16. An area must be identified for validation sticker, size is dependent upon length of VIN barcode, see example shown for relative size and placement.
17. A dotted line must be printed between the certificate/sticker insert and their duplicated. All other dotted lines are for illustration only.
18. Copy/Duplicate of Certificate of Inspection and Sticker insert.
    A copy of the certificate of inspection and sticker insert as described above must be reproduced directly below as shown in the example.
    The phrase "Tear off above portion and give to vehicle owner. Keep lower portion in file for 2 years with VIR copy." replaces "Important: Retain this document with your vehicle registration."
    The word "COPY" must be printed across the duplicated certificate and sticker insert. Example shows Arial 65 bold all caps.
    The sticker insert must only have EIS-assigned expiration month/year displayed.

Appendix C

Insert

Specifications

Only the sticker insert will be printed, if the current system date is greater than or equal to the "No Certificate Print Date" in the REGION table.

Sticker Insert
1. The EIS should print the sticker insert in the upper left corner as illustrated in the example. The text in the example "Only the sticker insert will be printed..." should not be printed.
2. The dotted line surrounding the sticker insert area is for illustration only.
4. The insert information must be printed within a 1.0" by 1.5" area
5. The insert area identified, in the example, by a dashed box must be 0.5" from the top edge of the paper and 0.5" from the left edge of the paper.
6. The sticker insert must only have EIS-assigned expiration month/year displayed in following format MM/Y.
7. For the sticker insert "Y", the EIS-assigned expiration year, the single digit must be the last digit of the year.
8. The MM/Y must be printed in Ariel, bold, 48 pt..
9. The license plate number must be printed in Ariel, bold, 12 pt.
10. The sticker number must be printed in Ariel, bold, 12 pt.

Copy of Electronic Record
1. The EIS will use the templete established for the exmples given on pages 231 and 233 with regards to format. However, please note the following sentences and their location, which differs from the previous format. "Remove insert and place on certificate of inspection sticker. Keep lower portion in the file as required by I/M Program Office." And "This copy of the electronic record is not valid for registration renewal."
2. Use the format, information, font sizes, as shown in the Appendix D, VIR examples, for each specific test. For those portions of the electronic record copy that begins with "VEHICLE INFORMATION."

Appendix D

Vehicle Inspection Reports

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.
Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)
12345678

Congratulations! Your vehicle passed the inspection.

TIN:

The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION

Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION					
VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**P**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**N**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **PASS**

Visual: **PASS**   Functional: **PASS**   Tailpipe Emissions: **PASS**   OBD: **PASS**

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____
I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.

Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)
12345678

VEHICLE INFORMATION					
Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION					
VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**F**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**P**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **FAIL**

Visual: **Pass**   Functional: **FAIL**   Tailpipe Emissions : **PASS**   OBD: **PASS**

Your vehicle failed the inspection because of missing, disconnected, defective or modified emission control equipment. For further information or assistance, please contact the referee facility.

WARRANTY MESSAGE (For Applicable Vehicles)

Please check with your authorized dealer for emission control warranty details. All vehicles that may be eligible for warranty repair shall be referred to the Authorized Dealer.

Vehicles with disconnected, modified, or missing emissions control devices require repair, regardless of cost.

Only those repairs made by a certified I/M mechanic, after an initial inspection is performed, will be considered for a repair cost waiver. If you need additional assistance, contact the local I/M program office.

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements: and (2) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

VIN: (BAR CODE)

ALASKA VEHICLE INSPECTION REPORT
Continued
Test Date/Time: 10/01/98 @ 07:43

RRN: (BAR CODE)

12345678

ADVISORY

Please be advised your vehicle did not pass the on-board diagnostic system (OBD) test. The purpose of the OBD system is to assure proper emission control system operation for the vehicle's lifetime by monitoring emission-related components and systems for deterioration and malfunction.

Specifically, your vehicle's OBD failed for the following reason(s):

While this is an advisory at this time, if your vehicle remains in this condition, it could result in an I/M test failure in the future.

If your vehicle is still under warranty, please contact the Authorized Dealer for repair, if not, contact a Certified I/M Test & Repair Facility. Proper maintenance and timely repairs will extend the life of your engine, assure good fuel economy and reduce air pollution.

Display VIR messages located in the OBD_Exemptions_Cursor procedure's VIR_Msg field for offline tests and in the Vehicle_Data procedure's OBD_VIR_Message field for online tests. Only display message if field(s) are populated for specific make, model and model year of vehicle being tested. Text box will expand to accommodate message length. Message will not wrap to additional pages. Text box of displayed messages will be dashed or enclosed by lines.

ALASKA VEHICLE INSPECTION REPORT
Continued
Test Date/Time: 10/01/98 @ 07:43

VIN: (BAR CODE)

RRN: (BAR CODE)
              12345678

Display appropriate VIR message located in Overall OBDII Result, B. VIR Messages, according to specific testing result or condition.

Display VIR messages located in the OBD_Exemptions table VIR_Msg field.. Only display message if field(s) are populated for specific make, model and model year of vehicle being tested. Text box will expand to accommodate message length. Message will not wrap to additional pages. Text box of displayed messages will be dashed or enclosed by lines.

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.
Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)
12345678

TIN:

Congratulations! Your vehicle passed the inspection.
The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION

Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION		

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	P	Intake Air Heater:	P	Air Injection System (AIS):	P
Positive Crankcase Ventilation (PCV) System:	P	Exhaust Gas Recirculation (EGR) System:	P	Emission Control Maintenance Light/Indicator:	P
Catalytic Converter(s):	P	Early Fuel Evaporation (EFE):	P	Major Vacuum Leaks:	P
Vacuum Hoses and Wiring:	P	Other Emissions-Related Components:	N	Malfunction Indicator Lamp/Check Engine Light:	P
Oxygen (02) Sensor:	P	Fuel Evaporative Controls:	P	Positive Crankcase Ventilation (PCV):	N
Carburetor/Fuel Injection:	P	Manifolds and Ignition:	P	Intake Air Heater:	P
		Malfunction Indicator Lamp	P	Early Fuel Evaporation (EFE):	P

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **PASS**

Visual: **PASS**   Functional: **PASS**   Tailpipe Emissions: **PASS**   OBD: **PASS**

Repair Actions: A "**Yes**" indicates: Checked, repaired, replaced, or adjusted. A "**W**" indicates under Warranty.					
EGR System	**Yes**	Exhaust System	**No**	Internal Engine	**No**
Electrical/Electronic System	**No**	Ignition System	**No**	PCV System	**No**
Evaporative Control System	**No**	Intake/Fuel Induction System	**No**	Other	**No**

Total Cost of Repairs (Parts & Labor) Performed: $407

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements: and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____
          I/M Mechanic Name: XXXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
          I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.

Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)

12345678

(i)   INCOMPLETE INSPECTION

VEHICLE INFORMATION					
Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION			
VISUAL INSPECTION RESULTS		**FUNCTIONAL TEST RESULTS**	
Air Injection System (AIS): **P**	Intake Air Heater: **P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System: **P**	Exhaust Gas Recirculation (EGR) System: **P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s): **P**	Early Fuel Evaporation (EFE): **P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring: **P**	Other Emissions-Related Components: N	Malfunction Indicator Lamp/Check Engine Light:	**N**
Oxygen (02) Sensor: **P**	Fuel Evaporative Controls: **P**	Positive Crankcase Ventilation (PCV):	**N/A**
Carburetor/Fuel Injection: **P**	Manifolds and Ignition: **P**	Intake Air Heater:	**P**
	Malfunction Indicator Lamp **P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	ABORTED	ABORTED	0.5	ABORTED	ABORTED	ABORTED	ABORTED	598
2500 RPM	220	ABORTED	ABORTED	0.5	ABORTED	ABORTED	ABORTED	ABORTED	2596

OVERALL TEST RESULT: **ABORTED**

Visual: **ABORTED**   Functional: **ABORTED**   Tailpipe Emissions: **ABORTED**   OBD: **ABORTED**

The Official I/M Test Was Aborted for the Following Reason(s):

Abort Code	Abort Description

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXXX Y. *ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ*

I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix D.5A
VIR-Continuation Page.
To be used with an abort
due to an incomplete
OBD readiness

ALASKA VEHICLE INSPECTION REPORT
Continued
Test Date/Time: 10/01/98 @ 07:43

Please be advised that your vehicle inspection could not be completed at this time. Your vehicle's on-board diagnostic (OBD) system was not able to complete a readiness evaluation. In order to demonstrate a "ready" condition the vehicle must be operated in a specific driving pattern. Your vehicle must demonstrate a "ready" condition prior to being tested so that test results are accurate. The purpose of the OBD system is to assure proper emission control system operation for the vehicle's lifetime by monitoring emission-related components and systems for deterioration and malfunction.

Specifically, your vehicle emission control systems not in a "ready" condition are:

Please contact your appropriate vehicle dealership for assistance in determining your vehicle's operating condition that must be accomplished in order to set the above code(s). When your vehicle has met the conditions listed above please return for an inspection. If you have questions concerning your vehicle's OBD system please contact your authorized service dealer for specific information.

VIN: (BAR CODE)

ALASKA VEHICLE INSPECTION REPORT
The I/M Program is improving air quality. Thank you for helping.

RRN: (BAR CODE)
12345678

Test Date/Time: 10/12/98 @ 08:51

In "TRAINING MODE" no certificate number will be entered or printed.

TIN: VOID

TRAINING TEST

VEHICLE INFORMATION					
Year:	**1985**	Make:	**FORD**	Model:	**F150**
VIN:	**2FTEF14N9FCB47189**	Engine Size:	**5.0L**	Cylinders:	**8**
License:	**7895CD**	GVWR:	**5999**	Vehicle Type:	**PICKUP**
Odometer:	**122611**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**AUTOMATIC**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**P**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**N**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **INVALID**

Visual: **PASS**   Functional: **PASS**   Tailpipe Emissions: **PASS**   OBD: **PASS**

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements ((2) the information on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

The "VOID" will appear below the emission information so that training test results may be readable.

Certified I/M Mechanic's Signature _____
I/M Mechanic Name: XXXXXXX XXXXX YYZZZZZZ ZZZZ ZZZZZZZ ZZZZZZZZZ
I/M Mechanic ID: XXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.

Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)   **12345678**

TIN:

The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION					
Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	P	Intake Air Heater:	P	Air Injection System (AIS):	P
Positive Crankcase Ventilation (PCV) System:	P	Exhaust Gas Recirculation (EGR) System:	P	Emission Control Maintenance Light/Indicator:	P
Catalytic Converter(s):	F	Early Fuel Evaporation (EFE):	P	Major Vacuum Leaks:	P
Vacuum Hoses and Wiring:	P	Other Emissions-Related Components:	P	Malfunction Indicator Lamp/Check Engine Light:	P
Oxygen (02) Sensor:	P	Fuel Evaporative Controls:	P	Positive Crankcase Ventilation (PCV):	N
Carburetor/Fuel Injection:	P	Manifolds and Ignition:	P	Intake Air Heater:	P
		Malfunction Indicator Lamp	P	Early Fuel Evaporation (EFE):	P

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: REFEREE OVERRIDE

Visual: **OVERRIDE**   Functional: **PASS**   Tailpipe Emissions : **PASS**   OBD: **PASS**

Reason for certification

Repair Actions:

A "**Yes**" indicates: Checked, repaired, replaced, or adjusted. A "**W**" indicates under Warranty. An "**O**" indicates override.			
EGR System	**Yes**	Exhaust System	**O**	Internal Engine
Electrical/Electronic System		Ignition System	**Yes**	PCV System
Evaporative Control System		Intake/Fuel Induction System		Other

Total Cost of Repairs (Parts & Labor) Performed: $457

VIN: (BAR CODE)

ALASKA VEHICLE INSPECTION REPORT
The I/M Program is improving air quality. Thank you for helping.   RRN: (BAR CODE)

Test Date/Time: 10/12/98 @ 08:51   **12345678**

WARRANTY MESSAGE (For Applicable Vehicles)

Please check with your authorized dealer for emission control warranty details. All vehicles that may be eligible for warranty repair shall be referred to the authorized dealer.

All vehicles with disconnected, modified, or missing emissions control devices require repair regardless of cost.

Only those repairs made by a certified I/M mechanic, after an initial inspection is performed, will be considered for a repair cost waiver. If you need additional assistance, contact the local I/M program office.

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) that this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements: and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix D.9
No VID Contact
Advisory
 Basic Example

If the modem fails to receive
an answer, receives a busy
signal, or if inspection data is
not transferred to the VID in
the specified time.

ADVISORY

During the emissions inspection test on your vehicle there were technical difficulties with communications, and your vehicle's electronic test result has been delayed in its transfer. Therefore, there will be a delay before you may renew your vehicle registration by phone or Internet. Please wait 72 hours before attempting to use an electronic means of renewing your vehicle registration.

ADVISORY

To be used as an advisory to
the motorist when the vehicle
passes the I/M test but some
problem is noted with the
vehicle during the test.

THE EMISSION CONTROL MAINTENANCE LIGHT/INDICATOR IS NOT FUNCTIONAL OR INDICATES THAT YOUR EMISSION CONTROL SYSTEM IS IN NEED OF A MANUFACTURER-RECOMMENDED SERVICE. MAINTAINING YOUR VEHICLE'S EMISSION CONTROL SYSTEM IS RECOMMENDED IN ORDER TO KEEP YOUR VEHICLE'S ENGINE RUNNING PROPERLY, MAINTAIN FUEL ECONOMY AND HELP REDUCE AIR POLLUTION.

Appendix
D11
VIR-OBD
W/O Visual
& functional
test
Basic
Example

ALASKA VEHICLE INSPECTION REPORT
The I/M Program is improving air quality. Thank you for helping.
Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)
        12345678

VEHICLE INFORMATION					

Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

OVERALL TEST RESULT: _____

Display appropriate VIR message located in Overall OBDII Result, B. VIR Messages, according to specific testing result or condition.

Display VIR messages located in the OBD_Exemption table VIR_Msg field. Only display message if field(s) are populated for specific make, model and model year of vehicle being tested. Text box will expand to accommodate message length. Message will not wrap to additional pages. Text box of displayed messages will be dashed or enclosed by lines.

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____
                    I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
                I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

<table>
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Appendix D12
VIR-OBD
W/O Visual & functional test
After-Repair
Basic
Example

</td><td>

ALASKA VEHICLE INSPECTION REPORT
The I/M Program is improving air quality. Thank you for helping.
Test Date/Time: 10/12/98 @ 08:51

</td><td>

VIN: (BAR CODE)

RRN: (BAR CODE)
         12345678

</td></tr>
</table>

VEHICLE INFORMATION

Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**GASOLINE**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

OVERALL TEST RESULT: _____

Display appropriate VIR message located in Overall OBDII Result, B. VIR Messages, according to specific testing result or condition.

Repair Actions: A "**Yes**" indicates: Checked, repaired, replaced, or adjusted. A "**W**" indicates under Warranty.

EGR System	**Yes**	Exhaust System	**No**	Internal Engine	**No**
Electrical/Electronic System	**No**	Ignition System	**No**	PCV System	**No**
Evaporative Control System	**No**	Intake/Fuel Induction System	**No**	Other	**No**

Total Cost of Repairs (Parts & Labor) Performed: $407

Display VIR messages located in the OBD_Exemption table VIR_Msg field. Only display message if field(s) are populated for specific make, model and model year of vehicle being tested. Text box will expand to accommodate message length. Message will not wrap to additional pages. Text box of displayed messages will be dashed or enclosed by lines.

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____
                         I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
                         I/M Mechanic ID: XXXXXXXX

STATION INFORMATION

Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix D.13
VIR-Passing
Basic Bi-Fuel
Example Page 1
Alt. Fuel Page.
=/< MY 1995

VIN: (BAR CODE)

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.   RRN: (BAR CODE)

Test Date/Time: 10/12/98 @ 08:51   **12345678**

Congratulations! Your vehicle passed the inspection.

The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION

Year:	**1995**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**BI-FUEL**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION		

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**P**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**N**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

ALTERNATE FUEL MODE: TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **PASS**

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix D.14
VIR-Passing
Basic Bi-Fuel
Example Page 2
Gasoline Page.
=/< MY 1995

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.

Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)

12345678

Congratulations! Your vehicle passed the inspection.

The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION		
Year: **1995**	Make: **TOYOTA**	Model: **4 RUNNER**
VIN: **JT3RN37XXXXXXXXXX**	Engine Size: **2.4 L**	Cylinders: **4**
License: **CSAXXX**	GVWR: **5400**	Vehicle Type: **SUV**
Odometer: **32780**	Cert. Type: **FEDERAL**	Fuel Type: **BI-FUEL**
Test Type: **INITIAL**		Transmission: **MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**P**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**N**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: PASS

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ
I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix D.15
VIR-Passing
Basic Bi-Fuel
Example
One page only
=/> MY 1996
Note: a failing
or not-ready bi-
fuel test will
require
additional
advisory pages.

ALASKA VEHICLE INSPECTION REPORT

The I/M Program is improving air quality. Thank you for helping.

Test Date/Time: 10/12/98 @ 08:51

VIN: (BAR CODE)

RRN: (BAR CODE)   **12345678**

Congratulations! Your vehicle passed the inspection.

The Certificate of Inspection is valid for registration renewal for 90 days from its date of issue.

Certificate of Inspection #:   F1170072

VEHICLE INFORMATION					
Year:	**1996**	Make:	**TOYOTA**	Model:	**4 RUNNER**
VIN:	**JT3RN37XXXXXXXXXX**	Engine Size:	**2.4 L**	Cylinders:	**4**
License:	**CSAXXX**	GVWR:	**5400**	Vehicle Type:	**SUV**
Odometer:	**32780**	Cert. Type:	**FEDERAL**	Fuel Type:	**BI-FUEL**
Test Type:	**INITIAL**			Transmission:	**MANUAL**

EMISSION CONTROL SYSTEMS UNDERHOOD INSPECTION

VISUAL INSPECTION RESULTS				FUNCTIONAL TEST RESULTS	
Air Injection System (AIS):	**P**	Intake Air Heater:	**P**	Air Injection System (AIS):	**P**
Positive Crankcase Ventilation (PCV) System:	**P**	Exhaust Gas Recirculation (EGR) System:	**P**	Emission Control Maintenance Light/Indicator:	**P**
Catalytic Converter(s):	**P**	Early Fuel Evaporation (EFE):	**P**	Major Vacuum Leaks:	**P**
Vacuum Hoses and Wiring:	**P**	Other Emissions-Related Components:	**N**	Malfunction Indicator Lamp/Check Engine Light:	**P**
Oxygen (02) Sensor:	**P**	Fuel Evaporative Controls:	**P**	Positive Crankcase Ventilation (PCV):	**N**
Carburetor/Fuel Injection:	**P**	Manifolds and Ignition:	**P**	Intake Air Heater:	**P**
		Malfunction Indicator Lamp	**P**	Early Fuel Evaporation (EFE):	**P**

P = Pass, D = Disconnected, M = Modified, S = Missing, F = Defective, N = Not Applicable

ALTERNATE FUEL MODE: TAILPIPE EMISSIONS INSPECTION									
	HC ppm			CO%			C02%	02%	RPM
	Limit	Reading	Result	Limit	Reading	Result	Reading	Reading	Reading
Idle	220	7	**PASS**	0.5	0.00	**PASS**	14.9	0.4	598
2500 RPM	220	8	**PASS**	0.5	0.00	**PASS**	13.9	0.5	2586

OVERALL TEST RESULT: **PASS**

Visual: **PASS**   Functional: **PASS**   Tailpipe Emissions: **PASS**   OBD: **PASS**

I certify that (1) I have personally inspected this vehicle in accordance with applicable state and local program Inspection and Maintenance requirements; (2) this vehicle has passed my inspection and qualifies for a Certificate of Inspection according to the program's requirements; and (3) the information listed on this report is true and correct.

Warning: False statements, representations, or certifications may be punishable by law.

Certified I/M Mechanic's Signature_____

I/M Mechanic Name: XXXXXXXXXXXXXX Y. ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

I/M Mechanic ID: XXXXXXXX

STATION INFORMATION			
Station Name:	Fairbanks North Star Borough Referee	Station Phone:	907-459-1005
Station Address:	3175 Peger Rd.	Station Number:	FT00012S
		Analyzer #:	BA090425
Station City:	Fairbanks, AK 99709	Software Version:	1.00

Appendix E

RESERVED

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Appendix F

List of Approved Aftermarket Parts

The Alaska Department of Environmental Conservation adopts by reference the standards approved by the California Air Resources Board (CARB) contained in Appendix F of this manual. An Executive Order (EO) found in Appendix F refers to parts evaluated and approved by the CARB. These parts or modifications have undergone an engineering evaluation by CARB and have been shown not to increase vehicle emissions and therefore granted an exemption to emission control system anti-tampering laws. The exemption is called an Executive Order (EO) and allows a modification to be installed on specific emission controlled vehicles.

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